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Improved Self-setting Trap.

The value of the fur trade on this continent is enormous and annually increasing. If trapping animals was reduced to something like certainty, the yield of "pelts" would be very much enlarged. In the engravings published herewith, we have shown a new self-acting trap for catching animals. That is to say, when one animal is caught he immediately sets the trap again; so that "one more unfortunate" is in a short time brought to share his captivity.

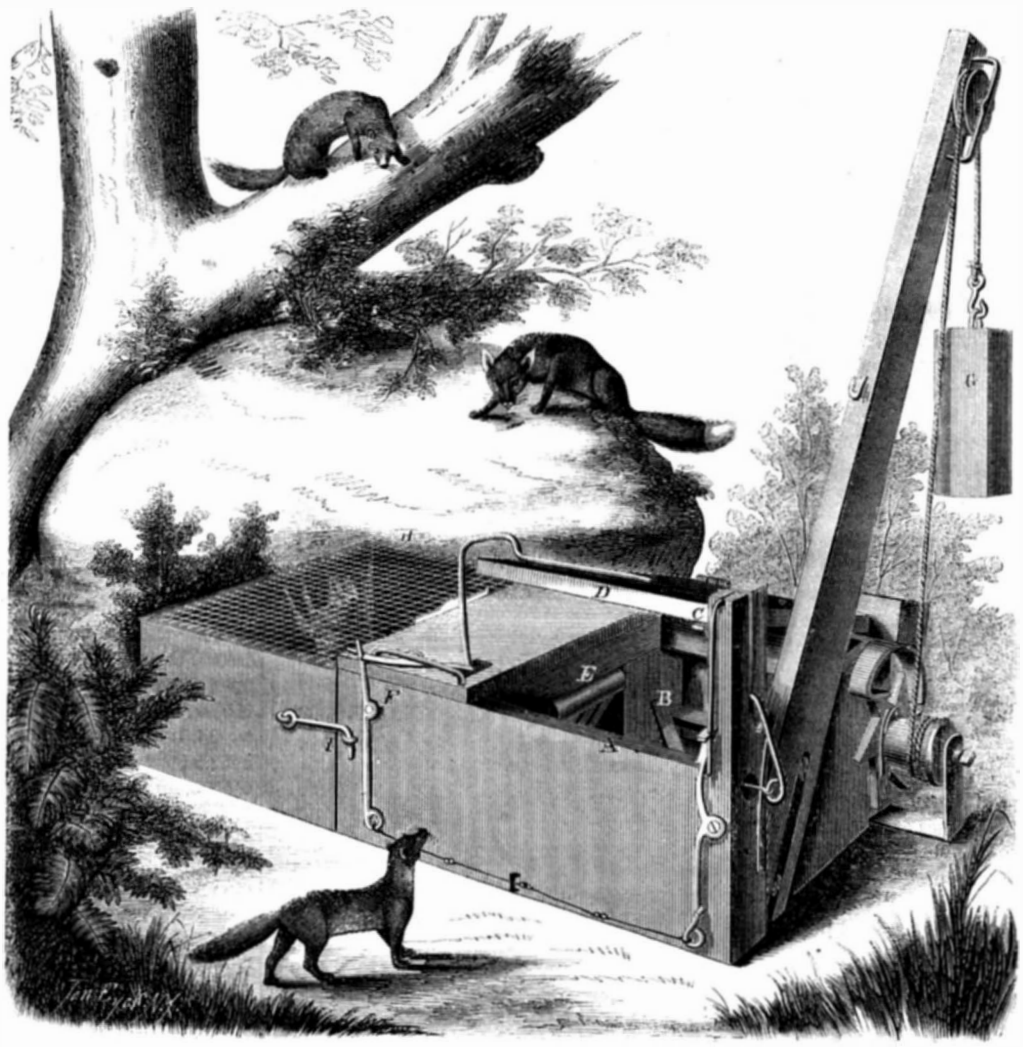
The sagacious fox seen in the back ground peering into the depths of the trap—the marten looking up to it with awe, and the fitch on the tree inspecting the already-caged individual below him, will soon, individually and collectively, be brought to join him, for with animals as with human nature, curiosity is a predominant trait.

In this trap the animal gains an entrance by leaping up on the edge of the trap, at A. The interior looks so inviting that he incontinently jumps in. Therein lies his error, for in alighting the animal strikes the triangle, B, which is merely a treadle hinged so as to trip the catch, C, which holds the cover, D, up; the cover then falls and shuts him out from the world forever. All is darkness inside, save at one point where a little light shows through. To the entrapped animal this light appears a way of safety to some favored spot, and he therefore noses his way into the promised land through the door, E. This door is connected with a series of catches, F, on the side, that liberate the trap door, D, and cause it to rise again, and thus set the trap for another animal. The weight, G, holds the trap door, D, by the aid of the escapement wheel, so that it cannot be raised from the inside. As the animals pass through the door, E, they emerge into a large well-lighted apartment, H, which is covered with wire net, and they can there roam round and bite each other at pleasure.

At the side of the trap there is another door, I, through which the prey can be removed at any time. Animals caught alive in traps are much more valuable for their fur than when maimed or shot outright.

This is an exceedingly useful and efficient trap, for by the aid of it numbers of animals can be caught at once without the formality of setting the trap for each one, and the trapper may leave it for days and be certain, when he visits it, of finding a goodly company assembled.

This invention was patented Dec. 27, 1864, through the Scientific American Patent Agency, by J. M. Flautt. For further information address him at Reedsbury, Wis.



FLAUTT'S SELF-SETTING TRAP.

Cuban Machine Agency.

Our readers will see by our advertising columns that Mr. E. K. Dod has opened an agency in Havana. The reputation of Mr. Dod and his family as mechanics and mathematicians is historic. His father was the originator of the enterprise, and builder of the machinery of the *Savannah*, the first steamer which crossed the Atlantic. The much-lamented Professor Dod, of Princeton, was a brother. Mr. E. K. Dod was one of the earliest locomotive builders in this country, and went to Cuba to organize the Havana railroad. We understand that reverse of fortune has made it necessary for him to return to active business, and we wish him all success.

J. A. Miller's Drying Kiln.

This valuable improvement, patented in 1864, is now coming into extensive use. For drying grain, corn, malt, flour, fruits, herbs, wool, paper, cloth, and all kinds of substances, it has no superior. It is said that with one of these improved kilns, two thousand bushels of grain can be thoroughly dried and cleaned with half a tun of coal, in one hour, without hand labor. Further information can be had at 200 Broadway, New York.

One-horse Mowing Machines.

A farmer of experience, Mr. J. I. Southwick, of Erie Co., N. Y., writes to the *Country Gentleman* as follows, upon the subject of a one-horse mower:—

"Having seen several inquiries for the notices of one-horse mowing machines, and having to look for a long time, I think I had better give a little account of my examination. First was Stoddard's; second, Kirby's; third, Howard's, then Wood's—all of which were nearly equal to their recommendations, and would do more than I wanted.

"Now, in my view, a one-horse mower should be a one-wheeled machine—as decidedly as a two-horse mower should have two driving wheels—for the reason that each driving wheel must be sufficiently heavy to operate the knife separately;—hence one is sufficient for one. The finger should be on a line with the driving wheel, and the thills far enough to the right so that it will rather haul to the left—that is, supposing the cutters to be to the right—and the knife sections not over three inches wide, for the width of section governs the length of crank, and the length of crank governs the draft per inch of swath. The driving wheel should be sufficiently concave to carry the main heft of the machinery. All this I have not seen in one machine. However, I got one of Howard's No. 1, and took it to a blacksmith's shop, and had the cutter bar cut down to two feet and nine inches; and now, with a small pony, can cut half an acre per hour easily."

Unparalleled Success.

The correspondent of the associated daily press notices the fact that, during the third week in June 184 patents were granted by the Patent Office. Of this very large number it appears that 84 cases were prepared and prosecuted through the Scientific American Patent Agency. This fact is doubtless a fair exhibit of the proportion of patent business transacted at this office, and also of the great success of thisworld-renowned Agency.

REDUCTION IN TERMS.

With a view to encourage the formation of "Clubs" for the ensuing volume of the SCIENTIFIC AMERICAN, we offer to take subscriptions in *Clubs of ten or more at* $2 50 *per annum*. We trust that our friends will set themselves to work to get up Clubs at the rate here proposed.

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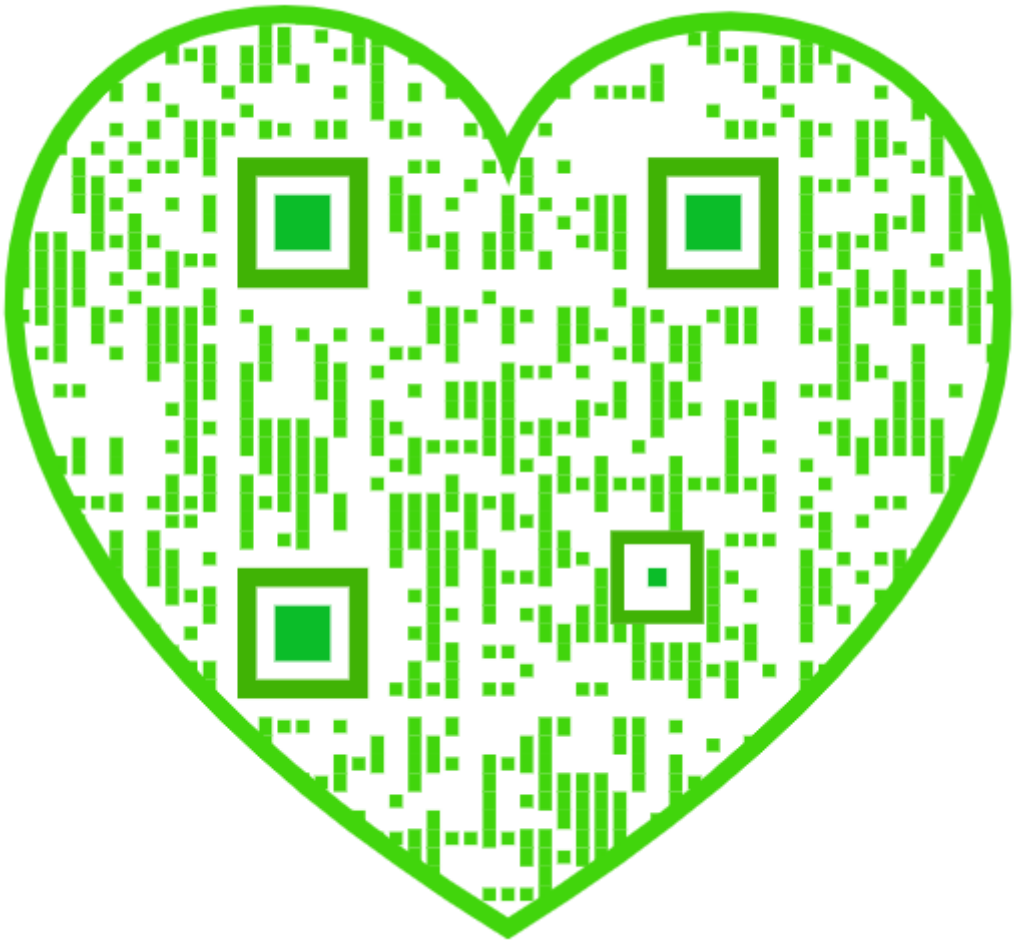

THE GREAT IMPROVEMENTS OF THE PAST NINE YEARS.

The London *Engineer* has a long article showing the fallacy of engineers and experts in condemning new improvements. The article consists in a summary of recent improvements which were pronounced impracticable by the engineering profession when they were first proposed, but which are now in successful operation. We make the following extracts:—

IRON PLATE BRIDGES.

How reasonable it appeared to many, at one time—less than twenty years ago—that plate iron bridges would crumple up like pasteboard or leather. Possibly there may be those, here and there, who remain still unconvinced, just as there are those who still refuse to believe in the strength and staunchness of iron ships. How many engineers there were who could not admit that cylinder foundations could be got in by simple atmospheric pressure; and there were others recently, who doubted that a disc pile could ever reach a strong footing in sand by pumping a stream of water through it and out at the bottom. How confidently, too, do engineers now employ concrete in numberless situations where once only stone and deep piling would have been considered secure.

IRON AND STEEL MANUFACTURE.

The changes which have been brought about, within the past few years, in the manufacture and working of iron and steel, are something almost incredible. It would have been reckoned sheer folly had engineers, even ten years ago, counted upon the general introduction of steel for railway axles and tyres; and steel rails were hardly known even three years ago. Krupp's immense ingots were, perhaps, amongst the greatest wonders of the International Exhibition—at least to minds capable of comprehending them; but it is likely that Bessemer's grand discovery—already brought by untiring energy and ready ingenuity to the rank of a large and rapidly growing manufacture, will work the greatest change in our applications of iron. Opinion has already been turned by it from unbelief into a confidence surer than any admiration however great. Even in iron-making by other processes, including the ordinary course of puddling, re-heating, and rolling, the progress in respect of the magnitude of the pieces wrought has been very great. It would have been seriously doubted, five or six years ago, whether armour plates a foot thick, and weighing each 20 tuns, could ever be made. McHaffie's malleable castings up to two or three tuns weight represent a great step also beyond anything known two or three years ago. This branch of manufacture has been greatly promoted by the improvement in crucibles, those of plumbago now withstanding sometimes a week's work in malleable iron making, and from sixty to ninety rounds in other casting where one or two, or three, was once throught very fair. Another extraordinary stride in metal working is that of drawing steel tubes from ingots in the cold state, by hydraulic pressure. We know more than one engineer who, until he had actually seen this done, refused to believe that it was even possible. The working of Siemens' regenerative furnaces, although easily understood, is almost as wonderful. It needs no strong prediction to declare that the means which give such a perfect control of temperature, without diluting the flame with uncombined oxygen, and which afford so great an economy of fuel, must come into very general use.

RAILWAYS.

To go on with inventions in connection with railways:—Who, upon learning the construction of the Injector, would have foreseen that it would work at all? Going a little further back, Eugene Bourdon's discovery, in his workshop, that a coiled still-worm tended to straighten itself under pressure, led to an invention which has conferred great benefits upon locomotive practice, by increasing the security of working and economising fuel. How much complication was removed from locomotive pistons by the introduction of Mr. Ramsbottom's slight and wiry rings, which it was believed by many would scratch the cylinders (and at first they occasionally did), and never remain tight? Messrs. Millar and Wakefield's steam-packed pistons embody an equally neat idea, but this idea—although we believe it was really adopted in practice by Spil'er, of Battersea, twenty years ago—was once pronounced absurd by more than one engineer. Then there are Mr. Adams' radial boxes which have attained to a thoroughly established success in the face of much and generally expressed doubt. The spring seated tyres, by the same gentleman, have by far outworn tyres set in the ordinary manner, and it is clear that what saves tyres must save the rails. We do not know that there is any "if" in the way of the success of the spring tyres, but even if they have not yet wrought a general change in the opinions of practical men, they have certainly attained a measure of success which, at one time, many would not have been willing to admit as possible. Another successful application which, until the success had been proved, many engineers would have rather ridiculed than doubted, is that of Mr. Ramsbottom's water troughs for "picking up" water into tenders in rapid motion. It is a great deal to have proved that no real difficulty has been found from dust or dirt in the water, and that during the first winter of its trial the trough failed once only from freezing up, and then only in consequence of the water being allowed to stand in it without the disturbance due to a current running through it. Our readers will have observed that, encouraged by so much success, more than one engineer is now considering the practicability of extending the water troughs, so as to give a continuous supply of water for any distance, without a tender, and, if found desirable, as upon trial it might be, to condense not the whole of the steam, for a part is needed for draught, but all remaining below the back pressure line at each stroke.

UNDERGROUND AND PNEUMATIC RAILWAYS.

The success of underground railways, both in a mechanical and a pecuniary point of view, is more than many could foresee, and our own columns of former years even testify that we then found ourselves compelled to doubt at least the commercial success of such lines—a success which has proved so great that we are glad to acknowledge that we have been disappointed by it. The success of the pneumatic post is already established, and we may now look, with some confidence, to the like success of the Waterloo and Whitehall Pneumatic Railway, the works of which, it is promised, will be finished in a year.

MARINE ENGINEERING.

In marine engineering, it is not many years since there was great unbelief in the economy, and even in the admissibility of the screw propeller. Less than three years ago, some of the cleverest engineers and shipbuilders in the kingdom pronounced twin screws, with independent engines, to be disadvantageous, if not impracticable. *Now* there can hardly be two opinions as to their value. One of the best points in connection with the modern screw engine is the wood bearings now so generally employed. They were designed in their present form by Mr. George D. Kittoe, and were very shortly afterwards adopted by the leading engineers, in the face of much doubt, we need not add. The re-introduction of super-heated steam, and the revival of surface condensation, have greatly qualified engineering opinion also. The use of marine governors, now so general, is in strong contrast with the once-prevailing belief in their utter uselessness. In nearly all these instances our readers will see that we are keeping within a very recent period of time, seldom extending so far back as the memorable week in Jauuary, 1856, when THE ENGINEER, fresh from our printers, first met the smile of public approval. We can write with confidence, now, of the ascertained advantages of invention which then were either unknown, or pining in the cold shade of unbelief. Belief was then unprofessional—unbelief, professional.

STEAM FIRE ENGINES.

How many engineers a few—a very few—years ago believed in steam fire-engines? The late Mr. Braidwood, who, of all men, one would suppose, was the best qualified to judge, refused to countenance them until years after they had taken their place in the established brigades of American cities. Captain Shaw has encouraged them, and the result is that they have been greatly improved, and now even surpass the best American steam fire-engines. They are now thought indispensible to the protection of London, as, indeed, of any city or town of sufficient size to maintain them.

TURBINES AND CENTRIFUGAL PUMPS.

It was not many years ago when English engineers thought a turbine a toy, and a centrifugal pump an ingenious puzzle in central forces—an hydraulic tee-totum for the edification of the disciples of science who throng the Polytechnic. Yet both the turbine and the centrifugal pump are now known to utilise from 70 to 80 per cent (and sometimes more) of the power applied to them; and this is more than can be said of the old lumbering water-wheels, or of other than the best made pumps.

MACHINE-PRESSED BRICKS.

What may be said of the now acknowledged value of machine-made bricks, of water-pressure engines, and of the simple and beautiful "disintegrator," now used by the artificial manure manufacturers? A few years ago there was nothing like the good old hand moulds for the wretchedest bricks; water-pressure engines, although anybody might have invented them, were not believed in; and the "disintegrator" was rather a curious example of a Catherine wheel revolving within a scintillating and bristling radiance of superphosphates than a useful and acknowledged invention.

STEAM PLOWING.

Nine years ago the late Mr. John Fowler first exhibited his steam plough at the Royal Agricultural Society's show at Chester. For five or six years afterwards it was doubted whether steam ploughs would "pay." Now they are made and worked by hundreds. It is a sad recollection that he, who did so much to conquer this success, should have been cut off so early from the enjoyment of his triumph. Steam locomotion on common roads, although a recognised practicability now, is still hanging fire, but is has gained much over the "practical" habit of unbelieving, whereby it was at one time pooh-poohed. Let us hope that coal-cutting machines will gain even as much in commercial confidence. They must, we can't help thinking, yet take the place of those subterranean slaves, the "putters and sinkers," and we hope the time is not further off than that when all town sewage will be returned to the land, instead of being cast into the sea.

GAS MAKING.

The gas engineers have learned much within a few years, and this amounts to a modification of opinion among them. It is now years ago since Mr. Grafton opened the way to the use of clay retorts by employing an exhauster, a thing which no gas company would, if they could, now dispense with. But it was not so long ago when gas engineers were shy of clay retorts, and had a series of objections—many of them imaginary—against them. They could not, they thought, get so much gas from a tun of coal in clay retorts as they could from iron, and then, it was said the clays required more coke. But an iron retort is now becoming as much of a curiosity as was the jaw bone—famous two or three years ago—of Abbeville. See, too, how the gas engineers have taken to iron oxides for purification and to the sulphuric acid treatment for ammonia.

It impoverished the gas, they said, and they still believe, justly no doubt, that it has entailed upon them the plague of napthaline. We wish one reform in gas works, and in spite of hostile opinion it will, like every other sensible and proper thing, yet prevail. That is, apparatus for charging and drawing the retorts, so as to dispense with the pachydermatous salamanders now employed at that task.

GUNS AND LOCKS.

The introduction of what Dr. Ure very properly termed automatic machinery in the making of guns and of locks, uprooted a world of trade prejudice, and overcame something even of professional misgiving. It is not so long since there were many to doubt "whether, on the whole, such machinery could be made to compete successfully with hand labor, taking all the requirements of these trades into due account." But there is no room for doubt under these heads now. It has been somewhat the same with wood-working machinery.

COTTON MACHINERY.

The cotton manufacture has seen successful changes, also, in the machinery not long ago em-

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ployed. Self-stripping cards are common now where, ten years ago, both breakers and finishers were always stripped by hand. Messrs. Hetherington's self-acting mule, too, has hardly one-half the parts, if indeed as many, as were originally embodied in Richard Roberts' great invention. Cotton spinners are notoriously jealous of revolutionary mechanical devices, yet the old mules are being superseded. A great change, too, has been wrought by the Blackburn "slasher," which, within a small space, does almost ten-fold the work of the old dressing frames. Mr. Bullough's and Mr. Taylor's inventions, too, are working their way into the weaving sheds of Lancashire. The beautiful operation of "gassing', the yarn—an invention of the late Mr. Samuel Hall, of surface condensing notoriety—is almost too old to be instanced in this list, but, palpable as were the advantages, there were prejudices to be overcome.

BREWING.

The brewers were resolute in their opposition to any invasion of the mysteries of their craft. They knew that many a vat of ale had gone off in a thunderstorm, and they argued that the damage was due to electricity, and galvanism, they though, must be the twin sister of the subtle fluid. So they would not permit of any conjunction of iron and brass in the fermenting tuns or in the cleansing rounds. Nothing but gun metal pumps and wooden vessels would answer. It is odd that they even permitted iron hoops upon kilderkins and barrels intended to be tapped with brass cocks. It was nothing that more than one chemist had passed currents of electricity through barrels of beer, and, although he might have decomposed a little of the generous liquid, it was none the worse for the experiment. Now the brewers have mashing machines, attemperators, cast iron boiling backs, and even slate fermenting squares—yes, *slate*. And there are centrifugal pumps and india rubber hose, yeast presses, and one or two enterprising brewers have tried hop digesters, hop separators, and spent hop presses—with what result we will not undertake to say; but it is evident that the brewers, interested, like other people, in making money, are no longer jealous of anything that promises a real improvement. So it is with the sugar refiners, and so also with the millers. But for a few formidable patents in their way, the latter would all be using decorticators, ventilated millstones, and stive rooms, and grinding, perhaps, twelve or fifteen bushels of wheat per pair of stones per hour.

It is in the success of what was at first believed to be doubtful or impracticable, that engineers gain confidence, and although the fact remains that many so-called inventions are really impracticable, or useless from other reasons, it does not the less follow that many new things which men of narrow views and scanty knowledge may believe to be impracticable, are nevertheless but waiting their time of success.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Composition for Enameling Metal, Wood and other Surfaces.—This invention relates to a composition, the chief ingredients of which are carbonate of lime and silicic acid, together with such other chemicals which assist in the formation of an insoluble silicate, in such manner that by the application of said ingredients to metal, stone, or other surfaces, an enamel is formed which is capable of resisting the influence of heat and of water, oils and most acids. By the addition of some substance containing iron, such as brown stone, copperas, etc., the composition above named forms an intimate combination with the wood fiber, and in this state it is particularly fit as a lining for barrels and other vessels intended to contain petroleum and other penetrating liquids. Ludwig Held, of Harlem, N. Y., is the inventor.

Device for Converting Motion.—This invention consists in the employment of a toothed segment which gears into a stationary toothed rack, and connects at its center with the piston rod of a steam cylinder or with another equivalent part of a motor or other machine, whereas an arm extending from said segment beyond its center, connects by means of a pitman with the fly-wheel or other equivalent device, secured to the shaft, to which a rotary motion is to be imparted in such a manner that the reciprocating motion of the piston rod, or other equivalent part, is converted into a rotary motion of the fly-wheel shaft by the combined action of the toothed segment rack and pitman, and the full power exerted by the said piston rod, or other equivalent device, is transmitted to the fly-wheel shaft without loss. F. Brewer, of Collinsville, Ill., is the inventor.

Machine for Turning Tool Handles.—This invention relates to a machine in which the blocks are placed into a V-shaped trough, from which they are taken up automatically one after the other by two sets of centers. One set of centers form the shafts of drums or pulleys, to which a revolving motion is imparted by a belt or by a friction wheel, or by both combined, and the other set of centers is arranged in a revolving head, and to each center a longitudinally sliding motion is imparted at the proper intervals by a cam in a forward direction and backward by a spring, in such a manner that the spurs on the revolving centers are driven into the block and the latter compelled to revolve with said centers. The trough containing the block is adjustable so that its position can be regulated to suit the thickness of the blocks, and it follows the revolving heads which carry the centers, for a short distance, until the block is firmly held between said centers in the desired position. The cutters are all stationary, the shaping cutters being secured in a segmental frame, and the cutting-off tool in a recess cut for that purpose in the frame. The shaping cutters are removable, so that they can be easily taken off and replaced by others, so that they can be sharpened and re-adjusted without difficulty. H. K. Jones, Kensington, Conn., is the inventor.

Brick Machine.—This invention relates to certain improvements in that class of brick presses in which the clay is tempered by a series of knives secured in a revolving shaft, and afterwards discharged on a grate which forms the bottom of a box in which the plunger moves. By the action of the plunger the clay is forced through the grates into the molds which are fed to the machine through a lateral opening and brought under the grate by the action of a pusher working on a roller platform and operated by a suitable lever arrangement. The invention consists in a peculiar mechanism for operating the plunger and the gate, which cuts off or opens the communication between the box for tempering the clay and the press box. This mechanism is so constructed that it occasions the least possible loss by friction, and that the motion of the plunger can be regulated according to the thickness of the bricks to be made. The press box is provided with a slide through which stones or other impurities can be made to discharge from the press box at any moment. The pusher, which serves to bring the molds under the grate, is operated by a hand lever secured to a rock shaft. From this rock shaft extend two arms which connect by suitable links with the pusher, in such a manner that by imparting to the rock shaft an oscillating motion, the pusher is moved back and forth on the roller platform, and the molds are carried in the desired position under the grate. Henry Martin, of Springfield, Mass., is the inventor.

Wheat Drill.—This invention relates to an improved machine for drilling in wheat and other grain, designed more especially for sowing wheat; it has for its object the depositing of the wheat in the earth in such a manner as to prevent the frost from throwing it out and also in arranging the several furrow cutters and their concomitant parts in such a manner that each will have a play or action independent of the other, so that they may conform perfectly to the inequalities of surface over which they may pass; and further, in attaching the draught pole to the frame of the machine by a joint to admit of the ready turning of the same, as well as freeing the furrow cutters from grass, weeds and other trash that is liable to clog or choke them. William Rice, Concord, Ill., is the inventor.

Sleeping Car.—The object of this invention is to produce a sleeping car which shall be well ventilated, each berth being supplied, if desirable, with independent appliances for that purpose. It consists in an improved sleeping car which embodies several new features, among which are a complete privacy and isolation of the several berths; also giving each berth an elastic support independent of the spring of the car body or of its trucks; also preserving the berths from the shocks of violent jars in horizontal directions, and also from noises which naturally result from such shocks; also, a peculiar construction and arrangement of the standards and other parts which pertain to the berths, whereby the standard can be removed, and the berths themselves be nested together, the result being that the interior of the car is then left entirely free and unobstructed throughout its whole area, so that all its seats can be used by passengers in the ordinary way; also other features hereinafter set forth. C. T. Harvey, No. 171 Broadway, New York, is the inventor.

Manufacturing Items.

Bridgeport, Conn., is rapidly becoming an important center of manufacturing operations. Having railroad and water communication with New York and other important seacoast and inland towns, it offers peculiar facilities for the establishment of almost every branch of manufacturing enterprise. Here are located the extensive works of the Wheeler & Wilson Sewing Machine Company, whose famous sewing machine is justly appreciated the world over. Elias Howe, Jr., the original inventor of the sewing machine, has recently erected one of the finest establishments in New England for the manufacture of his sewing machine, which has already gained a wide reputation, being adapted to perform all the heavier kinds of work required in harness, shoe and tailoring operations. The Simpson Water-proof Cloth Company are carrying on extensive works for the production of an excellent water-proof fabric for outer garments, which has been much used in the army. A thin coating of rubber is laid upon sheets of cotton cloth, and then faced with woolen flock, giving to the fabric a finish almost equal to the finest broadcloth. The article is superior to anything of the kind hitherto sold in the market. We understand that the company is about to enlarge its works. Hotchkiss & Co. have recently erected an extensive manufactory for certain kind of hardware. This firm also furnished to the Government during the war large quantities of the well-known Hotchkiss shell. The American Water-proof Company is about putting in operation large works for making water-proof goods. The extensive carriage factories of Wood Brothers, of No. 596 Broadway, are also located at Bridgeport. This firm has the deserved reputation of making the finest carriages in the country. Messrs. Wilmot & Kissam are now erecting a large brass mill which will soon be in operation. The Mallory Hat Company is also a new concern recently started in Bridgeport. This company is manufacturing large quantities of hats, the rims of which are supported by thin steel rings or bands, which keeps the rim always in shape, and without increasing the weight over the ordinary hat. There are several other smaller establishments located at this point which we cannot now notice.

THE "SCIENTIFIC AMERICAN."—The next issue of this widely circulated paper begins a new volume. It is undoubtedly the best conducted paper of its class in this or any other country. Mechanics will here find matter to interest and profit them, every week; the student, the chemist, the workingman, the philosopher—all seek its handsome pages for information on an endless variety of topics. It is generally acknowledged to be the "best popular expositor of the arts and sciences now extant."—*Hartford Times.*

THERE was lately shipped to the Charlestown Navy Yard, an oak log fifty-nine feet long and averaging thirty-six inches square. It contained five hundred and thirty-one solid feet of sound wood, and material for 6272 feet of inch plank. It weighed eighteen tuns, and was brought from Ohio in a raft of timber via the Erie Canal.

A SOLDIER train which passed through Sunbury Pa., last Wednesday, was composed of 77 cars, 68 of which contained men, and 6, horses. There were 2,955 men on board the train, which was nearly half a mile long and drawn by a single engine.

H. M. WOODWARD, of St. Louis, writes us that he heard the great explosion at Mobile at a distance of more than one hundred miles.

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THE BEST WAY TO MAKE BRASS TUBES.

On the afternoon of Friday, June 16th, a number of stockholders of the Columbian Metal Works, and other gentlemen who thought of taking stock, met at the depot of the Harlem railroad, by invitation of the directors, for the purpose of visiting the manufactory. Arrangements had been made for a special train, and in a halt hour's pleasant ride the party were taken to the works, which are situated in Westchester county, on the East River, very near the dock that was prepared for the Great Eastern when it was supposed she would approach New York through Long Island Sound. Within the spacious building was a long table nicely spread with wines and refreshments, which had been ordered from the famous keeper of restaurants, Delmonico, and some of his stylish waiters, in white vests and dress coats, were in attendance.

The process of making the tubes was first exhibited. They are cast in lengths of three or four feet, and drawn down on a mandrel through a die. The construction of the die constitutes the peculiarity of this manufacture; it is made of a dozen steel rollers or wheels, about half an inch thick and four inches in diameter, hung upon strong axles and set with their planes radiating from a common center, with their peripheries slightly grooved, so as to form of the space between them a round hole. Thus the metal in place of being scraped down as in the solid or "dead" die, is subjected during its passage to a rolling action. The inventor claims that while the action of the dead die is to impa t a fibrous structure to the metal, and diminish its transverse strength, the rolling action of this die preserves the homogenous character of the metal, and secures its equal strength in all directions.

The gentlemen of the party commenced their observations by a general inspection of the works, which are of remarkable simplicity, solidity, and thoroughness in their construction. The machinery is of the most massive character; it is propelled by a beautiful condensing beam engine of 300 horse power, which is driven by the waste heat from the melting and annealing furnaces, all the apparatus is conveniently arranged, and ample room is provided for conducting the operations with ease and facility.

The several processes of the manufacture were then shown, beginning with the melting of the metal. The molds are of iron, the two halves being held together by strong wrought iron rings. The core is made of gas pipe three-fourths of an inch in diameter, punched full of holes, wrapped with a small band of straw, and covered with molding sand. The brass is melted in plumbago crucibles holding about six quarts each. A pot was raised from the furnace by three men, by means of long tongs fitted to grasp it securely; it was of a glowing red color, and white fumes of zinc were playing in flames and rolling in volumes from the surface of the molten metal. The molds were set upright, and the red hot brass was poured into one after another until three of them were filled from a single pot. The rings were immediately removed and the molds were opened in order that they might be heated as little as possible from the hot brass within.

As soon as the tubes were sufficiently cooled, they were taken to the dies to be drawn down. There are 8 setts of dies, permitting the drawing of 8 tubes at a time. Each die is placed in the middle of a pair of planed iron ways, which extend 12 feet on each side, allowing tubes of this length to be drawn. Between the ways on each side is an endless iron chain, the upper section of each chain moving in a direction from the die, and blocks of cast iron, fitted to slide upon the ways, are provided with jaws for holding either end of the mandrel, and with strong keys by which they may be locked to any link of the chains. One end of the mandrel is tapered and has a head for the hold of the jaw. The tube was thoroughly greased with tallow, and the mandrel with sperm oil. Then the tube was slipped upon the taper end of the mandrel, this was passed through the die into the jaws of the sliding block, and the key was dropped, locking the block to the moving chain. The whole power of the engine being upon this chain, the mandrel, with the tube upon it, was slowly drawn through the die, the rollers of which pressed and elongated the tube, and its rear end was seen crawling along the mandrel.

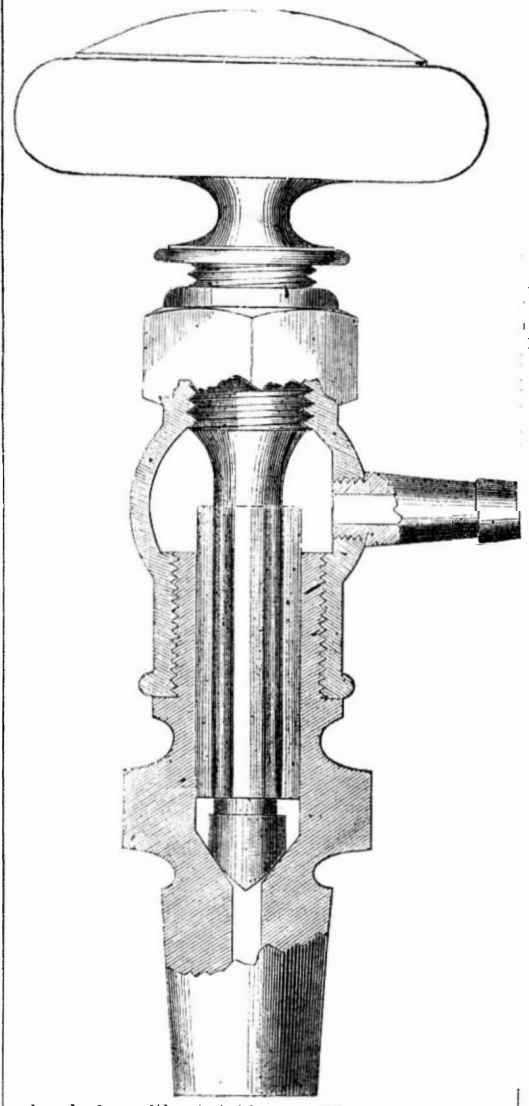
After the passage the tube fitted so closely upon the mandrel that the power of the engine was required to draw it off, and it was for this service that the chain moving in the opposite direction had been provided. The small end of the mandrel was unlocked from its chain, a stationary jaw fitting closely around it at the rear end of the tube was closed, and the key was dropped, locking the opposite end of the mandrel to its chain. The mandrel was thus slowly drawn from out the tube.

A portion of the invention consists in a very ingenious devise for loosening the tube on the mandrel. In the passage through the die slight ridges are raised between the rollers on the exterior surface of the tube, and a second series of rollers are provided to roll down these ridges, without, it is said, elongating the tube, but simply pressing the metal of the tube and thus enlarging its diameter.

After the exhibition of the manufacture, Mr. Pirsson stated that the machinery was invented and had been constructed by Mr. Wm. T. Brooks, originally of Medford, Mass.; that a company had been formed with a capital of $500,000, that the works and patent would be put in at $320,000, and $180,000 more was wanted in cash for working capital. Of this $180,000, $80,000 had already been taken, leaving $100,000 which was still offered. He said that the brass manufacture had been very profitable, the stock of the Scoville company being worth now 900 per cent premium. Several gentlemen present then put down their names on the stock book, $33,000 being taken on the spot.

BROUGHTON'S GAGE COCK.

This engraving represents a new gage cock which is conveniently constructed to admit of being ground



when leaky without taking it off the boiler. Appended is the inventor's description:—

"The attention of engine builders, boiler makers, engineers, and others using steam boilers, is invited to the above gage cock, as possessing the features of simplicity, and a facility of being reground at any time, without being removed from the pipes or boiler, not found in any other gage cock now in use. Fig. 1 is a representation—partly in section—of the improvement. It will be seen that the shank is made to screw into the boiler in the ordinary manner, but the globe or body of the cock is detachable from the shank, a screw joint which connects the shank and body together, being made about midway in the length of the cock. The shank is chambered or bored out in a cylindrical form, at the bottom of which is the ordinary valve seat. The valve or stem screws into the nozzle or front of the cock in the ordinary manner, but is elongated, and extends forward and through the cylindrical chamber of the shank to meet the valve seat at its bottom. The diameter of the central stem is less than that of the chamber in the shank, and four radial wings are cast upon it. These wings extend outwards, and correspond in diameter to the bore of the shank, and form a guide and support to the valve stem when the body of the cock has been unscrewed and the valve replaced in the chamber for regrinding. Thus, to regrind this cock and put it in order when leaky, the body is unscrewed and taken off, leaving the shank in the pipe or boiler. The valve is then replaced in the shank and is free to rotate; the wings on the stem forming a perfect guide and support, and keeping it perpendicular to its seat. The valve is rotated by the handle, thus dispensing with the use of screw drivers or other tools, and the operation is so simple, and can be so easily and quickly performed, that parties using them need never be troubled or annoyed by leakage. These gage cocks are made of the best steam metal, and have mahogany handles attached to the stem in a substantial manner. They are simple and not liable to get out of order, and may be reground any number of times without being removed from the boiler; consequently they are durable. They can be reground easier and quicker than any other gage cock."

Patent now pending. Manufactured by Broughton & Oakman, 41 Center street, near Duane, New York

ANOTHER PNEUMATIC RAILWAY IN LONDON.

The *Mechanics Magazine* has a long article on the Whitehall railway, from which we take the following extracts:—

It is an old notion, and by no means an erroneous one, that the power acquired by atmospheric pressure would realise greater safety, economy, and expedition than that obtained by the ordinary locomotive. The trial of the system of atmospheric propulsion for fourteen years in the line from Paris to St. Germain, bears witness to the absolute security attending its adoption. We have also had practical experience in this direction on some of our own lines. But the system has failed, and this has been due to the imperfect manner in which it has been carried out. Notwithstanding all that was done to develope the principle, it had to be abandoned, not from any inherent fault or fundamental error in the principle itself, but because the details of its application were not sufficiently mastered to render it a practical success. To ensure the effectual working of the atmospheric system, tunnels and a piston carriage must be substituted for the old arrangement of tube and traveling piston; such a system of working, for instance, as that in operation on the experimental line at the Crystal Palace. Here a power has been developed by which trains have ascended inclines inaccessible to the ordinary locomotive. This result is obtained from the pneumatic system, which differs materially from the former atmospheric system. By the new method, the train is wholly within the tunnel or tube, by which arrangement all the difficulties attendant upon working the continuous valve are entirely overcome. Leakage is thereby avoided, and a considerable further advantage is obtained in working at reduced pressures, and with proportionate economy. With the old arrangement a pressure ranging from 120 to 160 ounces per square inch was required to move the train, but under the new conditions a pressure of not more than 3 or 4 ounces per square inch is all that is necessary. In the Crystal Palace tube the train is moved through a tunnel having an area 80 or 90 square feet, at the rate of 30 or 40 miles per hour, by a pressure of only $2\frac{1}{2}$ ounces on the square inch. This propulsion is simply due to the pressure of the air behind the train, so that, in effect, the pneumatic system is but a modified application of the process of sailing to railway trains. The

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practical utility of this system has been proved not only by the successful working of the trial passenger railway at Sydenham, but also by that of the Pneumatic Despatch Company. It is now to be further tested on a practical working scale, upon a railway about to be made from the Waterloo station across, or rather through, the bed of the Thames to Charing-cross. The bill for this line has not yet been obtained, it is true, but it has passed the House of Commons, and is unopposed in the Lords, so that for all practical purposes it may be acted upon as though it had recived the royal assent.

The importance of this system of working railways, and the novel position of the line, justify somewhat more than a passing glance at the engineering arrangements, which will be carried out under the direction of Mr. T. W. Rammell, engineer to the Pneumatic Despatch Company, and with whom Sir Charles Fox and Son are joint engineers. The new system affords great facility for communication under water. Taking advantage of this, it is proposed to lay a line of tube in the bed of the Thames so as to unite the north and south sides of the river, between the two points embracing the important localities of the Charing-cross and the South-western railway stations. According to the Parliamentary plans the line will commence in Great Scotland Yard, where there will be an open station, the level of rails being here about 16 ft. below surface. It will be carried thence by a brickwork tunnel under the Thames Embankment to the river, which at this point is about 1,000 ft. wide. Here the line will be continued by water-tight wrought-iron tube, about 18 ft. in diameter, which will be made of $\frac{3}{4}$-in. plate, and girt at about every 36 ft. with a deep wrought-iron rib, to which will be connected lighter longitudinal ribs, also of wrought iron. The tube will be further surrounded by light ribs of T or L iron, placed intermediately between the larger encircling ribs, the whole forming a stiff network to strengthen and stay the tube. The outer surface of the tube will be coated to the thickness of 18 in. with concrete, for the purpose of adding weight to the tube. By this plan it will be brought to about the specific gravity of the surrounding water, and the ironwork will also be protected. The bed of the river will be divided into four spans, of 250 ft. each, by means of three sunk cylinder piers; there will also be two abutment piers. These piers will carry the tube, which is about to be manufactured in four lengths of 250 ft. each. A perfectly practical and satisfactory arrangement has been made for connecting the ends of the tubes, which will be tied down to the piers. Messrs. Samuda have undertaken the manufacture of the tube, and to Messrs. Brassey have been entrusted the laying and other incidental works. From the abutment pier on the Lambeth side the line will be continued in brickwork under College street and Vine street, to a station convenient for the York road and Waterloo station traffic. The gradients fall from either station to the centre of the river, at which point the line is level for a short distance; the steepest gradient will be about 1 in 30.

It will be seen that the line is intended for local traffic only, and it is proposed, upon the success of the first section being established, to extend the line on the one hand to the Tottenham-court road, and on the other to the Elephant and Castle. This will add tenfold to the value of the line, by bringing it into close communication with the Metropolitan Underground Railway at one end, and the Metropolitan Extension of the London, Chatham and Dover Railway at the other. The engine-house will adjoin the station at the Waterloo end, where will be placed the pumping engine for working the line. Although only one main tube is to be used, arrangements have been made by which three trains will be kept working at once. One will be at each station unloading or loading, whilst the third is traversing the line, the time of transit occupying only about a minute and a half. By means of two branch tubes from the main tube to the engine, trains will be driven by pressure to Whitehall, and drawn from thence by exhaustion. The carriages will, of course, be properly lighted and comfortably fitted similarly to those on the Metropolitan Railway. It is reckoned that about thirty trains per hour will be run, and from calculations based upon well-ascertained data, there appears to be every probability that the undertaking will prove a commercial as well as an engineering success.

It cannot be questioned that the pneumatic system possesses many advantages over the locomotive system which specially recommend its adoption on the Waterloo and Whitehall Railway. If this line proves a success, and at present there appears no reason why it should not, the system will, doubtless, receive a very widely-extended application. It presents economical features both in construction and working, not obtainable by any other plan. The diameter of the pneumatic tube being less than that of a railway tunnel, the lines can be constructed with greater expedition and at a less cost. The heavy expenses attending the acquirement of property are greatly reduced if not entirely avoided. In the case of the Weitehall line the construction will not involve the demolition of a single dwelling house, the entire line passing under streets and open spaces. The working of the system, too, is comparatively noiseless; this, and the freedom from vibration, recommend its use where a locomotive line would be prohibited. The dead weight and encumbrance of the engine and tender are at once got rid of, and the service thus rendered more prompt, and better adapted to the exigencies of a short local traffic. All the dangers attending the locomotive system arising from breaking down, collision, or explosion, are neccessarily absent; trains can neither leave the rails, nor meet within the tube. The system also complies with the condition laid down as those under which alone tunnel lines ought to be worked. It is unattended by the objectionable compound of stifling and humid vapours, which Mr. Fowler's best precautions cannot entirely prevent on the Metropolitan Railway. Not only is the generation of gases avoided, but the tunnel is completely ventilated by the continuous draught of air through it. The motive power being stationary, the working expenses and cost of maintenance of the line will be very much less than under the ordinary system; the wear and tear of rolling stock may likewise be reduced to a minimum.

The facility with which steep gradients and sharp curves can be worked is evidenced by the Crystal Palace tube, which is constructed with a gradient of 1 in 15 and curves of 8 chains radius; on the Whitehall line the worst gradient is about 1 in 30. Such, then, are the leading advantages of the pneumatic system, the working of which is about to receive practical illustration in a position where there are doubtless thousands daily, who would much prefer being whisked across in a minute and a half, for a penny or twopence—which we believe are the proposed fares—to making a long detour over either of the bridges. Deducting the halfpenny toll payable on Waterloo and Hungerford bridges practically reduces the fares to a halfpenny and three halfpence respectively. Although the engineering details have been well digested and worked out, and every care has been taken to perfect the arrangements, it may be found advisable to vary or alter these as the work of practical construction proceeds under these novel connitions. But the principle will remain the same, and to it we look with considerable hope for the future working of short lines for local traffic in the metropolis.

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its Room at the Cooper Institute on Tuesday afternoon, June 27th, the President, N. C. Ely, Esq., in the chair.

SEVENTEEN-YEAR LOCUST.

Dr. Trimble presented a box of locusts received from a correspondent of the club residing in Cayuga county, and stated that it was the seventeen-year locusts of that locality. Each species or variety of these remarkable insects is confined to one locality. They come out of the ground once in seventeen years, and live above ground about three weeks. During all this time the males are singing, or rather drumming with their wings, and the concert of such hosts makes a sound that can be heard a long distance; people have said that they have heard it two miles. In South America there is a locust whose note is so loud that a single individual can be heard a mile. The females during this time are laying their eggs in the branches of trees. Dr. Trimble exhibited some twigs which were filled with the eggs. A longitudinal slit is cut in the branch, and at the bottom of this a transverse section is laboriously sawed to receive the eggs in a compact row, standing on their ends like a row of ninepins. In about two months they hatch, when the worms fall to the earth and immediately crawl into the earth, where they live and grow for seventeen years, subsisting on the roots of trees, grass and other plants. In 1860, when they prevailed in New Jersey, the speaker hatched a number of eggs under a glass receiver, the lower part of which was filled with earth and supplied with grass roots. The larvæ immediately crawled into the earth and attached themselves to the grass roots; if the grass was pulled up, the worms were drawn out also, clinging to the roots. Dr. Trimble said that he had dug into the ground andfound the worms with the proboscis inserted in the root of a tree, sucking the sap. The moisture from the body of the worm had formed a casing in the clay, which it was necessary to break open in order to find the worm.

Mr. Williams :—Do the locusts eat anything in their winged state?

Dr. Trimble:—They do not. They have no organs for eating. The locusts mentioned in Scripture as being so destructive were a different insect from the one that we call the locust. Perhaps they were some species of grasshopper.

Mr. Bergen:—Is the August locust the same as the 17-year locust?

Dr. Trimble :—It has never been ascertained whether the August locust requires 17 years for its growth in the larva state or not. The insects come up irregularly, and the time required for the developement of an individual is unknown.

Mr. Williams :—Do I understand Dr. Trimble to say that the 17-year locust is hatched only in trees, and goes into the ground directly beneath the trees I have seen them coming out of the ground in multitudes in grass land where there were no trees.

Dr. Trimble :—But are you sure there were no trees in that place 17 years before?

Mr. Williams :—That might have been.

LADY BUGS.

Mr. Bergen:—Dr. Trimble has stated here a good many times that lady bugs do no damage. Now, with all his superior knowledge of insects, I can correct him on that point. I sent one hundred and ten bushels of squashes to Fulton market day before yesterday; I have for several years raised large quantities of squashes and pumpkins, and my vines have been extensively eaten by lady bugs.

Dr. Trimble:—There is an embarrassment in discussing this subject with men until they begin to know something about it. The trouble with Mr. Bergen is that he does not know a lady bug from a squash bug. Lady bugs do not eat any vegetable substance whate ver; they live wholly upon other insects and their eggs.

A Singular Statement.

It is stated in California papers that neither gold, silver, copper or any other mineral of value which has been found in that state, was discovered by a scientific geologist, though many of them had traveled over the ground where they were afterwards obtained. Neither have scientific men ever been useful in discovering large deposits of these articles.

[This paragraph has a slight disadvantage, which detracts from its value—it is untrue. The existence of gold in California was pointed out by Prof. Dana, who was attached to Wilkes's Exploring Expedition, long before it was known to the world. Dr. Charles Jackson, of Boston, discovered one of the finest emery beds in the world in Massachusetts, and it is certainly 30 years ago since Prof. Hildreth called attention to the existence of oil in Ohio.—Eds.

Novel Inventions.—Patents have been obtained in France for an instrument to indicate the existence of minerals or springs of water in land:—for raising a ship into the air, and steering it there:—for applying steam to children's toys:—for heating and lighting apartments with the same apparatus;—for a mode of lining letter envelopes with silk:—and for a cane which you can put in your pocket and transform into a seat at will.

It is estimated that there are fifty thousand persons in the Southern States who are excluded under the amnesty proclamation of the President.

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Notes and Queries

H. L. A., of Ill.—The most exhaustive work on chemistry is that of Gmelin, published by the Cavendish Society, in 16 volumes, at $5 per volume. Booth's Encyclopedia of Chemistry is an excellent work, but the various chemical manufactures are treated more at length by Muspratt. For a methodical treatment of the subject from a scientific point of view, we know of no work superior to Gregory's. Miller's is more recent, but only the first volume of that—Chemical Physics—has yet been republished in this country. The best work on the microscope is Carpenter's, but we know of no special treatise on the solar microscope. James Green, No. 175 Grand street, manufactures philosophical instruments.

C. A. C., of Cal.—The latest and fullest investigations in relation to tapeworms were made by Dr. D. F. Weinland, who has dissected more than 5,000 animals in the prosecution of his inquiries. The leading facts ascertained by him were given in full on page 10, Vol. 7., (new series), Scientific American. He describes two hundred species of tapeworms, five of them being found in man, though only two of these five are at all common He considers pomegranate bark the most efficient remedy.

W. A., of N. S.—Horn is softened by heat. For pressing and molding the temperature of boiling water is sufficient, but for welding scraps into a common mass a higher heat is requisite. With care, horn may be exposed for a short time to the temperature of melted lead without injury.

A. H., of Pa.—We fail to discover any patentable novelty in your reclining chair, and cannot advise you to apply for a patent.

R. N. R., of N. H.—It is the duty of every patentee to stamp the date of the patent upon the article vended in the market. Failing so to mark the article no damage can be recovered from an infringer, except on proof that he was notified of such infringement, and continued after such notice to make or vend the article patented.

M. D. A, of N. Y.—Your device for running cars on the track after they have been thrown off strikes us as novel and useful. Such apparatus would save much time and property.

H. W. S., of U. S. N.—Your plan for applying rubber grummets to condenser tubes is the same as that being practised in the use of Sewell & Cameron's condenser.

J. S. W., of West Va.—The stem of your valve was doubtless driven into the heater by water pressure. When the water from the heater ran into the pump, as it naturally did, it forced the bottom valve up and the broken stem fell down the pipe. The return stroke of the pump caused the water to surge back and forth in the pipe, which, by degrees, carried the stem into the heater. This is the only explanation we can offer.

T. W. B., of Ohio.—We are much obliged for your article on the "Circumference of the Elipse," but we find it too entirely mathematical to suit our readers.

R. H. I., of C. W.—In order to take out a patent on the same terms as a citizen you must reside in the States one year next preceding your application, and in the mean time have made oath of your intention to become a citizen. An inventor must in all cases make application for the patent, but he can by assignment transfer it so that the patent may issue to the assignee.

E. H., of Ohio.—If we should satisfy ourselves that you had succeeded in squaring the circle, and that you could demonstrate it by a simple diagram, we should be pleased to publish the demonstration, but we do not believe that you can satisfy us of this.

L. L. V., of C. E.—We do not know of any iron firm who would be likely to buy your ilmenite ore; but if you should make its existence generally known to iron manufacturers you might find a purchaser.

J. S., of N. J.—We know of no better treatise on acoustics than that contained in Silliman's First Principles of Philosophy.

M. K., of Mo.—The explanation of the "curious clock" puzzle which you send us is precisely the same as that which we gave when we published the description of the clock. We are pleased to see our supposition confirmed on so unquestionable authority.

D. B., of Mass.—A soft transparent varnish may be made of Canada balsam, and a harder one of bleached gum shellac.

J. L. B., of Pa.—If you have a patent for your invention parties cannot use it without infringing your rights. You can sue infringers in the United States District Courts.

E. K., of Pa.—If the blotting sand about which you inquire is attracted by a magnet, you may consider it magnetic oxide of iron. All the blotting sand that we ever saw was of this substance.

O. P. H., of N. H.—At the time of our latest information John C. Fremont, of this city, was president of the Pacific Railroad.

E. P. R., of Miss.—We do not know of any work that will learn a man to run a stationary engine other than hard work; books cannot teach engine driving. A treatise on the indicator can be had of H. C. Baird. Esq. & Co., No. 406, Walnut street, Philadelphia.

D. S., of N. Y.:—We thank you for your good opinion of our paper. Engineers are now licenced in this city or are obliged to pay five dollars to some one for a certificate which is probably what the law means

T. W., of N. Y.—We have an impression that the term "odic force," is employed by the spirit rappers; some of those people have an office on the south side of Canal street just east of Broadway.

Correspondence

Tempering Mill Picks.

Messrs. Editors:—Will you be so obliging as to publish what you know about tempering mill picks. But I suppose it is kept a secret by mechanics, and when they profess to give a receipts keep the main or principle item back, unless they can obtain a handsome reward. Respectfully, N. D.

Fleming, Mich., June 19, 1865.

[Steel is hardened by being heated to a cherry red and plunged in cold water. Then the temper is drawn by warming the metal; the more it is warmed the softer and less brittle it becomes. The neatest way to temper the point of a pick or chisel, is to harden the end only, and allow it to be re-warmed by the heat remaining in the mass of the tool. As soon as the point assumes the right color, the whole tool is plunged again in water to prevent the temper from being reduced too low. Butts gives the following table of the colors and corresponding temperatures for the temper of various tools:—

A very pale straw	430°	Lancets.
Straw	450°	Razors.
Darker straw	470°	Penknives.
Yellow	490°	Scissors.
Brown yellow	500°	Hatchets.
Slightly tinged purple	520°	Saws.
Purple	530°	Hammers.
Dark purple	550°	Springs.
Blue	570°	Springs.
Dark blue	600°	Soft, for saws.

Proportion of the Weight to the Wings of Birds.

Messrs. Editors—In looking over some back numbers of the Scientific American, I found a communication (which I did not notice at the time of its publication) from a Mr. Gillispie, on the subject of the flight of birds, flying machines, etc., which I think contains an error and which might have a tendency to mislead persons unacquainted with the subject, and a desire to correct the error is my apology for troubling you with this notice. Mr. Gillespie says an eagle will spread about one square foot of wing for every four or five pounds of its weight. Now if he means to convey the idea, as the statement would imply, that the weight of the eagle is from four to five pounds for each foot of wing that it spreads, he makes a great mistake, and to satisfy you of it I will state a few facts that have come under my observation. In the summer of 1826 I lived in Ohio, some two miles from the shore of Lake Erie. In the fore part of the summer I frequently observed a pair of eagles carrying food to their young, and one day I took my rifle and went into the woods in search of them. The result was that I shot from the tops of some lofty pines an old and two young ones. They were of the kind that I suppose is called the bald eagle, that is the old ones were white, head and tail, but the young ones were a dark iron grey, with no white on them. The young ones were full grown, even larger than the old one that I killed. They were rare game for me and therefore I took particular note of their weight and dimensions. The old bird measured 6 feet, 8 inches from tip to tip of the wings and weighed 8¾ pounds. The smallest young one measured 7 feet and weighed 9½ pounds, while the largest young one measured 7 feet 4 inches, and weighed 10¼ pounds. The breadth of the wing of the largest bird was 16 inches, and from the best estimate that I can make from recollection of the shape of the wing the bird must have spread in its natural flight from 6¼ to 6½ feet of wing. Now 6¼ feet and 10¼ pounds gives one pound and from 10 to 11 oz. to the square foot of wing. It may be possible that such a bird could carry a weight in addition to its own sufficient to make from 4 to 5 pounds to the square foot, but I think if it did it would be with the greatest exertion and only in a short and down hill flight.

The crow and several kinds of hawks I have ever considered a pest to the farmer and therefore you will not think it strange if I say that with the aid of powder, lead, and traps I destroyed a great number of them in my younger days, and have weighed and measured many specimens of them and I do not recollect an instance where they varied 2 oz. from 1¼ pounds to the foot of wing; even since I first read Mr. Gillispie's statement I have weighed and measured a large specimen of the crow and it did not vary an ounce from 1¼ pounds to the foot of wing. With the small-winged birds I have had less experience, but I do not believe that any species can be found that make any pretentions to rise in their flight that carry more than 2½ pounds to the foot in their natural flight. I have never seen a turkey buzzard except on the wing, but I have been told by those who have examined them, that they were very light in proportion to their wings and from their appearance I have no doubt of the truth of it.

I wish that Mr. Gillespie or some other person might succeed in making a practical flying machine, but I shall have little hope of their success unless they make a different calculation on the weight that birds carry. John Partridge.

Pittsfield, Mass., June 10, 1865.

A Leaden Ball Sustained by a Steam Jet.

Messrs. Editors:—About a year ago, while attempting to find the force with which a jet of steam issued from a small orifice, I had occasion to place a small leaden bullet over it, which was cupped for its reception. As I gradually turned on the steam imagine my astonishment at finding that the ball, instead of being thrown on one side, as I expected, was actually suspended about 12 inches above the orifice, oscillating for a few seconds in a vertical direction, and having at the same time a wonderfully rapid rotary motion about its vertical diameter. After repeated trials I found this latter motion to be always in the direction of the hands of a watch—the eye being above the ball. It could be raised or lowered, by increasing or diminishing the amount of escaping steam. On being pushed a little without the axis of the jet, it would immediately return to its former position. I have been entirely unable to explain either the rotary motion or the force which kept the ball in the axis of the jet. The fact may be an old story to the readers of the Scientific American, but to me it is certainly new. Will some one favor me with an explanation? C. H. A.

Fulton, Mo., June 13, 1865.

[A common ornament of water fountains is a ball sustained in this way by the jet of water. The cause of its being held within the jet has been the subject of much discussion. It any of our readers can give a clear explanation we should be pleased to receive it.—Eds.

Corrosion of Electro-plated Articles.

Messrs. Editors:—I have made articles for my family use of real silver and german silver, heavily electro-plated with fine silver. My object of writing you is to inquire why it is that the plated articles should tarnish so much quicker than the real silver ones. I have thoroughly investigated this subject, and have not been able to come to a satisfactory result. I placed an article of silver and one of plated on a high shelf, where any gases would ascend, and the silver one remains as it was when put there, but the plated one turned almost black in a few days. By answering the above through your journal you will much oblige an old subscriber. Chas. A. Gardiner.

New York, June 10, 1865.

[The trouble doubtless arises from the imperfect cleaning of the electro-plated articles. It is well known that the solution adheres to the metal, and cannot be removed by mere washing. The remedy is to scour and burnish the surface thoroughly.—Eds.

Telegraphing in Bad Weather.

Messrs. Editors:—I would like to make an inquiry or two through your valuable paper in reference to circumstances of every day occurrence on telegraph lines. Every operator must have observed that on rainy days offices near the middle of the line, with main battery at each end, have a great deal of trouble to "adjust" high enough to get offices at extremities of the line, and still be low enough for offices nearer the center of the line. In other words, the current of electricity seems to be more powerful at the ends of the line. Now can this be so while we both are supplied from the ends of the line? And why is it that on such days magnets that ordinarily work well, when adjusted for offices near by (adjusted

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low) will not work at all from extremities, but appear to be fixed.

As these are questions that must occur to every inexperienced operator I would respectfully request a reply through your paper, which might call out other ideas of interest. TELEGRAPH OPERATOR

Ionia, Mich., June 14, 1865.

[The difficulty of telegraphing in bad weather results from extraneous currents which prevent a complete discharge of the magnetism on the breaking of the circuit. This makes it necessary to increase the tension of the spring in order to draw the armature away from the magnet, and then to enable the magnet to overcome this increased tension, it is necessary to set the armature nearer to it, making a shorter vibration; this is called adjusting "fine," or "high." The generating of extraneous currents in damp weather is involved in mystery, but it seems reasonable that the nearer to the magnet the circuit is broken, the less would the influence of these currents be felt.— EDS.

Cartridges in Cold Weather.

MESSRS. EDITORS:—Some weeks since I saw in your paper a letter from Mr. Cleveland stating that metallic cartridges were liable to miss fire in cold weather. I have had a great experience in firing these cartridges for many years and at all seasons and I never noticed anything which gave me cause to suppose that the temperature had any effect upon them to impair their reliability. I inclose you herewith a copy of a report of some experiments made at the National Armory, Springfield, also a copy of account of trials made by C. D. Leet, Esq., Metallic Cartridge Manufacturer, Springfield, Mass.; both these series of experiments have been made since the publication of Mr. Cleveland's letter.

C. M. Spencer.

Boston, Mass., June 28, 1865.

MR. LEET'S EXPERIMENTS.—I took eighty-four cartridges and buried them in ice at least two feet from outside of box and allowed them to remain forty-eight hours. I then took them out and fired seven rounds, every one fired; in a half hour fired seven more, no miss; I then put part of them in the sun, south side, very warm, and allowed them to remain some three hours; seven rounds of these fired and no miss; during this time I had fired most of the others and still could not get a miss-fire, and thought this a fair test. Our Government Inspector has fired cartridges during all the past winter every day but Sundays and he has taken them from the magazine as needed, some days when they were like so much ice, and his experience is that the weather has nothing to do with it; the quality of fulminate or the manner of putting in has more to do with a miss-fire than the weather. C. D. LEET.

Springfield, Mass., June 21, 1865.

[The report of Major Laidley is an elaborate table of the trial of 512 cartridges, which had been exposed to temperatures ranging from 2° below zero to 30° above, and it concludes with this certificate:—"There was not a cartridge in all of the above trials which did not go. I could not see the difference between those that had been in the freezer the greatest length of time and those that had not been in at all. —EDS.

Why Coal-mining Machines are not Used.

MESSRS. EDITORS:—I notice in your paper of the 10th inst., a copy of a resolution offered at the "Iron and Steel Association," to encourage the invention of coal-mining machinery. We might have had more than one coal-mining machine in Pittsburg, but for the opposition of coal dealers and producers; they opposed the introduction of mining coal by machinery on the following grounds:—The first effect would be to stop strikes among miners. You will say that is a strange reason, but the explanation is this; when the miners ask one cent per bushel more for digging, the dealer added two cents per bushel to the consumer, so that you will see very clearly the object in opposing the introduction of coal-mining machinery. This, if not the expressed, is the implied reason for not encouraging the introduction of coal-mining machinery in this city. W. D. R.

Pittsburgh, June 12, 1865.

Trials of a Patentee.

MESSRS. EDITORS:—I have read with interest the letter from A. C. T. of May 12, 1865, under the above caption, on page 356 of present volume SCIENTIFIC AMERICAN. He is not alone, I assure you. I have had considerable experience in that way myself. Neither is Galesburg, Ill., the only place where patent thieves reside; your own city, New York, is full of them. The dodge of obtaining a power of attorney did not work in my case, yet it was urged very strongly. I have tried several of them who were highly recommended as honest, high-minded men, but alas it was not so with those with whom I have had to do. I therefore warn all patentees to beware of patent agencies, patent exchanges, etc., for the sale of patent rights. Should I be so fortunate as to receive another patent, I shall publish it for sale in the SCIENTIFIC AMERICAN, have it illustrated besides, as any sensible man would do. I regret not having my patents illustrated, as you advised me; it would have been hundreds, perhaps thousands, of dollars in my pocket had I done so. Bought wit is the best sometimes. J. T.

Madison, Ind., June 21, 1865.

More Than Satisfied.

MESSRS. MUNN & Co.:—I have to-day received "letters patent" for my improvement in boots and shoes. Please accept my thanks for your care and skill, which has brought to a successful issue your application on my behalf. My friends remark the dispatch with which this has been done. When I know of a friend having business at the Patent Office, I shall consider I am consulting his interest by pointing out to him the advantages of your Agency, and I am sure it must be a source of professional pride to you to have your clients say they are more than satisfied. Yours, very respectfully,

EDWIN CHESTERMAN.

Roxbury, Mass., June 30, 1865.

Russia.

Bayard Taylor contributes, in the *Atlantic Monthly* an interesting sketch of "Winter Life in St. Petersburg."

A RUSSIAN DAY.

"For darkness, rather than cold, is the characteristic of the St. Petersburg winter. The temperature, which at Montreal or St. Paul would not be thought remarkably low, seems to be more severely felt here, owing to the absence of pure daylight. Although both Lake Ladoga and the Gulf of Finland are frozen, the air always retains a damp, raw, penetrating quality, and the snow is more frequently sticky and clammy than dry and crystalline. Few, indeed, are the days which are not cheerless and depressing. In December, when the sky is overcast for weeks together, the sun, rising after nine o'clock, and sliding along just above the horizon, enables you to dispense with lamplight somewhere between ten and eleven; but by two in the afternoon you must call for lights again. Even when a clear day comes, the yellow, level sunshine is a combination of sunrise and sunset, and neither tempers the air nor mitigates the general expression of gloom, almost of despair, upon the face of nature.

"The preparations for the season, of course, have been made long before. In most houses the double windows are allowed to remain through the summer, but they must be carefully examined, the layer of cotton between them, at the bottom, replenished, a small vessel of salt added to absorb the moisture and prevent it from freezing on the panes, and strips of paper pasted over every possible crack. The outer doors are covered with wadded leather, overlapping the frames on all sides. The habitations being thus almost hermetically sealed, they are easily warmed by the huge procelain stoves, which retain warmth so tenaciously that one fire per day is sufficient for the most sensitive constitutions. In my own room, I found that one armful of birch-wood reduced to coal, every alternate morning, created a steady temperature of sixty-four degrees. Although the rooms are always spacious, and arranged in suites of from three to a dozen, according to the extent and splendor of the residence, the atmosphere soon becomes close."

A RIDE ON AN ICE HILL.

The ice hills erected in the Russian cities for purposes of amusement have often been described; but the sensations of an ice ride have seldom been more vividly narrated than in these words:

"I engaged one of the *mujiks* in attendance to pilot me on my first voyage. The man having taken his position well forward on the little sled, I knelt upon the rear end, where there was barely space enough for my knees, placed my hands upon his shoulders, and awaited the results. He shoved the sled with his hands, very gently and carefully, to the brink of the icy sleep; then there was a moment's adjustment, then a poise, then sinking of the heart, cessation of breath, giddy roaring and whistling of the air, and I found myself scudding along the level with the speed of an express train. I never happened to fall out of a fourth-story window, but I immediately understood the sensations of the unfortiunate persons who do. It was so frightful that I shuddered when we reached the end of the course and the man coolly began ascending the steps of the opposite hill, with the sled under his arm. But my companions were waiting to see me return, so I mounted after him, knelt again, and held my breath. This time, knowing what was coming, I caught a glimpse of our descent, and found that only the first plunge from the brink was threatening. The lower part of the curve, which is nearly a parabolic line, is more gradual, and the seeming headlong fall does not last more than the tenth part of a second. The sensation, nevertheless, is very powerful, having all the attraction, without the reality, of danger.

CANDLES.

"Although the streets of St. Petersburg are lighted with gas, the palaces and private residences are still illuminated only with wax candles. Gas is considered plebeian, but it has probably also been found to be disagreeable in the close air of the hermetically sealed departments. Candles are used in such profusion that I am told thirty thousand are required to light up an Imperial ball. The quadruple rows of columns which support the Hall of St. George are spirally entwined, with garlands of wax-lights, and immense chandeliers are suspended from the ceiling. The wicks of each column are connected with threads dipped in some inflammable mixture, and each thread being kindled at the bottom at the same instant, the light is carried in a few seconds to every candle in the hall. This instantaneous kindling of so many thousand wicks has a magical effect."

A New Blow Pipe.

A novel blow pipe is thus described in a foreign journal :—

Hendy's blow pipe is an instrument which combines simplicity and efficiency in a great degree; it consists of an ordinary blow pipe nozzle, supplied from an India rubber reservoir. The main portion of the blow pipe is made with a joint, at which a valve is placed, which is opened when the operator blows, and closed immediately when he ceases. By this arrangement the little bag or bladder is readily filled at a single breath, and with very little exertion. When so filled a continuous current of air is forced from the nozzle of the pipe by the mere contractive force of the gutta percha. The force is uniform until the air is nearly exhausted. The current may be easily varied or entirely cut off by gently pressing the fingers upon the neck of the bladder above the nipple to which it is attached. Mr. Hendy has recently made a further improvement by attaching a rubber hose between the mouth piece and the pipe, enabling the blower to change his position without disturbing the direction of the current on the object upon which it is turned.

Great Profits from Chemical Refuse.

Mr. Joseph Jones of Widnes, England, writes to the *London Mining Journal* as follows: Vat and black ash waste, owing to its large quantities, has caused chemical masters to incur expense to remove it from their premises, for want of room to put it in. It is composed of sulphide of calcium, sulphate of lime, etc., with about 10 per cent of sulphur. The sulphur is precipitated by muriatic acid, aided by an oxidizing process (such as "steam," by the action of the sun, etc.) There is no doubt of the fertilizing effect of sulphur upon the soil. The remaining part of the waste is further decomposed by acid of nitre (nitrate of soda). There are other fertilizing effects of muriatic acid upon black ash waste; 600 tuns of muriatic acid are thrown away weekly from some chemical works, which manufacture salt cake, etc.

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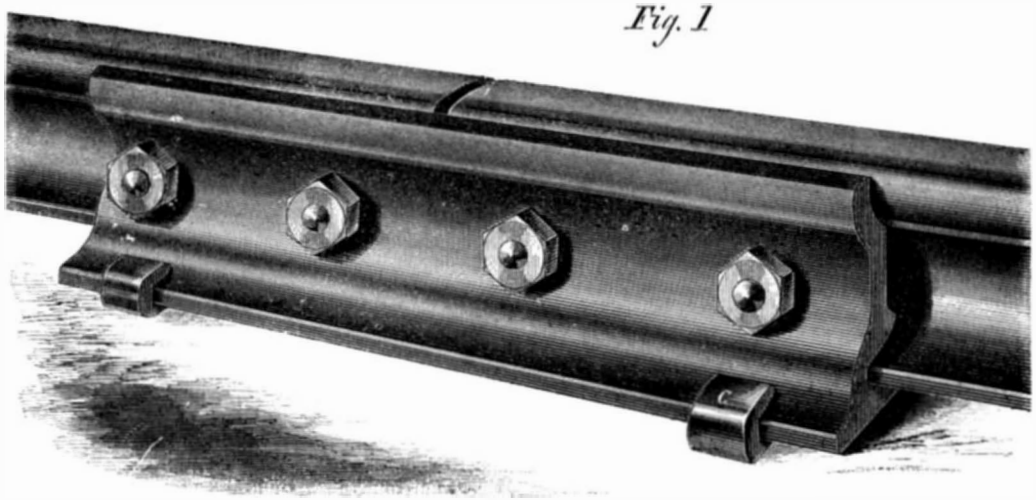
Improved Railroad Chair.

All persons who travel on railroads have noticed concussions at times, more or less violent according to the velocity of the train. These blows are caused by the wheels striking the ends of the rails. The latter are set one quarter of an inch apart, to allow for the expansion of the line in hot weather, and the ends raise up, thus affording the wheel an opportunity to strike them. The object of the chair here shown is to hold the rails in position and keep the heads or ends always on the same plane, so that whatever distance apart, the line will be uninterrupted and without a break from end to end.

The engravings explain themselves so thoroughly

Fig. 1



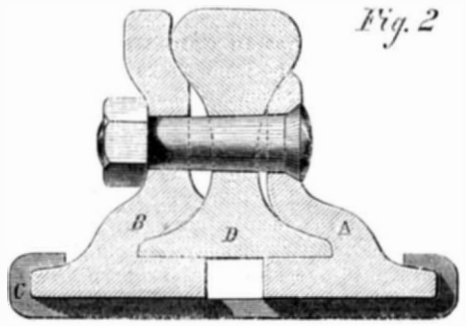


Fig. 2

JONES'S RAILROAD CHAIR.

that further comment seems superfluous, all parts being clearly illustrated. It will be seen that the chair is made in two parts, A and B, and that the ends of them are united by links, C. The base of one half the chair sits on the foot of the rail at D, and holds it down while the sides are held by bolts and nuts, the bolt holes being made oval to allow the rail to expand.

By this method of constructing a chair, rails can be used much longer, in fact until they are worn out and will not require to have the ends dressed while the face of the rail remains sound.

The expense of repairs to rolling stock will also be reduced from the absence of violent blows which, if they do not break the axles outright, are the source of much unnecessary outlay. This rail and chair will render traveling much easier to the public, since a smooth and noiseless transit is at all times preferable to a jolting one.

A patent was procured on this chair by J. H. Jones, through the Scientific American Patent Agency, on March 14, 1865. For further information address the patentee at Ironton, Ohio.

The "American Mower."

The accompanying engravings represent one of the marked peculiarities of the "American Mower," recently patented by William Van Anden, of Poughkeepsie, N Y., through the Scientific American Patent Agency. Figs. 1 and 2 represent the self-lubricating crank pin, and Fig. 3 the self-oiling journal cap—each of the engravings showing sections of the parts represented. Oil is introduced into the chamber, C, of the crank-pin wheel at the supply hole, A, until it is half filled or until it runs out from the discharge hole, B. The supply hole, A, is then closed with a pin, leaving the chamber quite tight except the discharge. When the machine is in motion the oil is kept by centrifugal force against the outer part of the chamber, C, but whenever a corner is turned or the motion stopped, a small supply, but enough to lubricate and prevent heating without wasting the oil, falls into and passes through the discharge hole to the pin. Fig. 3 shows an oil reservoir or chamber, E, with a hollow stem in the center communicating with the journal, H. This stem is closed by a poppet valve, F, which, by the jolting of the machine, is thrown up enough to receive small portions of the dashing about oil on its shank, and this drips down upon the journal. The chamber is closed with a stopper, G. With these contrivances it is claimed that a man may keep his mowing machine constantly at work for half a day without once stopping to oil up, thus saving at least 10 per cent of the time required for work.

Besides these self-oiling arrangements the "American Mower" combines more advantageous points than any other we know. Whether these "points" will prove as efficient as the inventor claims, is yet to be seen, but a friend who has used the machine declares himself abundantly satisfied of its superiority.

Fig. 1.

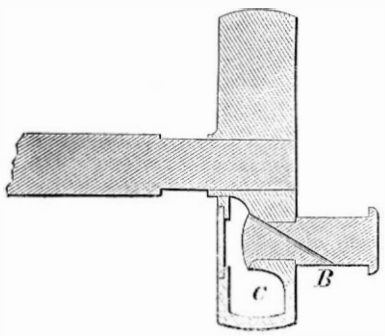


Fig. 2.

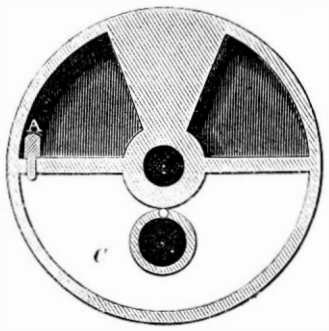
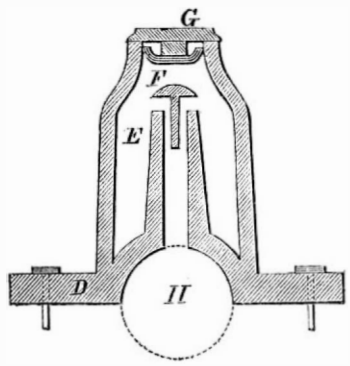


Fig. 3.



VAN ANDEN'S AMERICAN MOWER.

A New Developer for Photographic Negatives.

Add an ounce of sulphuric acid to three ounces of water, and set aside to cool. Then add to this liquid an ounce of good gelatine; let it swell and dissolve, placing it for that purpose in a slightly warm place, not exceeding blood heat, for twenty-four hours. Then add iron filings in excess, avoiding all application of heat; let it stand for several days. Finally add a little acetate of soda as before; filter, and dilute to fifteen ounces.

It is very curious to observe the power which the gelatine exerts as a restraining influence. This developer contains a very large quantity of sulphate of iron, much more so than is usually employed in a developer, and yet it stands in need of no free acid to check it; and the restraining is so effectual that it may be kept on the plate twice as long as a common iron developer with fogging. In this respect, as well as in the color which it gives to the image, it resembles pyrogallic acid.

There is also something in the consistency of the solution which renders it very pleasant to work with. While the viscidity of the gelatine is quite gone, there is a certain oiliness in the liquid which makes it cling to the plate, and flow evenly over it. It seems, too, to be more independent in this respect of the condition of the nitrate bath as respects alcohol than an ordinary iron developer; and the absence of tendency to fog renders it allowable to simply add nitrate solution where redevelopment is required.

It thus becomes practicable to quite dispense entirely with pyrogallic redevelopment, except in those rare cases where an extremely thick deposit is wanted. In such cases pyrogallic acid can scarcely be replaced, except indeed by gallic acid, which I have used in the accidental absence of pyrogallic. Mixed with nitrate of silver in solution and acetic acid, it presently assumes a purplish-inky color, but remains clear and redevelopes very well.

Whenever a new developer is recommended, it becomes a matter of interest to know whether the negatives taken with it will be permanent. There is nothing in this developer which would tend to a contrary supposition, and some negatives which I developed with it nearly a year ago are in perfect order. Since that time I have had it in use, and would not be without it. It brings out the halftones and details in the shadows very agreeably, and tends to yield soft and pleasant prints.

As respects its keeping properties, I think it can be relied on for two months, which is ample time. I have some now which is full six months old, and which still developes well, but not, I think, quite so well as the fresh.

I would especially warn those who may prepare this developer for themselves to apply heat only as directed in the formula, and not to any greater extent or degree.—*Mr. Carey Lea, in British Journal of Photography.*

Dr. B. Howard, formerly Assistant Surgeon U. S. A., now in England, has brought to the notice of Earl Grey his improved ambulance lately used in our army, which has received the approval of the highest officials of the English War Department.

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VOL. XIII. NO. 2...[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JULY 8, 1865.

THE LOST ARTS.

Because certain moldy and ill-smelling mummies have been resurrected from the Pyramids of Egypt and found covered with fine linen—because the tombs wherein they have lain for centuries are covered with caricatures of beasts, birds and fishes—because uncouth and ungainly ornaments of gold are found deposited in such tombs—divers persons wander off into extravagant praises of the lost arts, of the subtle and ingenious artisans who lived thousands of years ago, ignoring the wonders of to-day and the skill of their own countrymen.

If the mummies be an evidence of the taste of the ancients, the less said the better. Ugly in their lives, embalmed they are not improved, and the *scarabeus* or beetle with which persons of high rank were ornamented is suggestive of another more unpleasant insect quite familiar to housekeepers. Even the pyramids from whence these musty relics of the past are exhumed, might have been built in half the time by modern artificers, with brown stone fronts, if desirable, and slated with alternate rows of purple and green tiles. What a waste of Egyptian time and money they represent!

So also with that Sphinx which glowers at Ethopia from its seat in the sand, as if suffering from the recollection of some overpowering wrong. If it be a lost art to construct such hideous monstrosities as these, let us congratulate ourselves that the world has grown wiser and better with the lapse of centuries.

Herculaneum and Pompeii, unearthed from the ashes of Vesuvius, show little or no trace of the arts which have been lost. A few bronze lamps of uncouth shapes, some pottery remarkable for its curious decoration, some tiles and frescoes of unquestionable character and tendency—these are some relics of the state of the arts among that people at the time they were overwhelmed.

In Morocco and in Spain, ruins tumbling into decay, courts wherein fountains tinkled through the night atmosphere heavy with the scents of orange grooves, tesselated pavements, and columns fretted with intricate designs, are the only signs, the only evidence to build on that the arts ever existed. Arts, not in the sense of gingerbread finery and gilding, but arts by which whole villages earned bread for their families in the sweat of their faces.

In Egypt at this day—land of the pyramids, of the ruined cities, of the crypts wherein musty princes molder into powder—the wretched native cracks his wheat in a stone mortar, or, worse, in a rag bruised between two stones. In Italy and in Imperial Rome—famous, in centuries long since transpired, for all that wealth could procure—the beggars chatter importunately at every step, and the fields are as barren and infertile as they were hundreds of years ago.

It is not on the wide Campagna that the modern reaper or a Yankee mower gets an opportunity to exhibit its qualities. It is not on the slopes at the foot of the Alps that the soil is turned up to the sun by cultivators and corn plows. No! mechanism is tabooed! The arts have no chance, and the way of centuries is the way of to-day.

Though the existence of oil lakes was known to the ancients, no use was made of them. Fish oil gave forth its feeble glimmer in their lamps for years, and the solar radiance of kerosene was strange to domestic circles. In like manner the want of knowledge of natural products, of the infinite combinations they are capable of, of the use they may be put to, were almost unknown to the ancients—utterly so, compared to the knowledge of the present day.

There was, indeed, no lack of sensuous decoration for palaces, there was no want of stimulants, no absence of anything that appealed to the grosser nature of man in those ancient days, but the artisans were familiar with only the rudest of mechanical contrivances.

No hundred thousand spindles whirred in cotton factories from morning till night, no engines moved swiftly and noiselessly, no railroads clasped the land in their embrace. The earth bore in its bosom then, as now, copper and iron, but for want of artisans, for want of the skill and cunning to work it, little benefit accrued to the possessors thereof. Brass could be put to no better use than making a huge image to straddle the strait at Rhodes.

In the ancient days lived Praxelites, Phidias and Apelles, sculptors of rare talent, who cut from the silent marble statues that seemed instinct with life; but these, however they may have appealed to the taste of men at that time, never helped the poor to a decent living, put no garments on the naked, nor built up towns and cities as does the machinery of to-day.

For all that cultivates society, for all that tends to make mankind refined, intellectual and human, we have the fullest respect and appreciation, but we despise that affectation which accords to barbarians, or nations semi-civilized, more culture, more genius and more mechanical skill than we possess at the present time. The world moves forward, not backward, and the generations of to-day are wiser than those which are not, ever were. The arts, in a generic sense, are not those delicate refinements of painting and music by which, white-handed and gifted sons of genius get a living, but they are those stern, hard realities in life which, by the practice of them, turns the intractable iron stone into ductile metal, which level the fores, which turn the wilderness into cities, which open up lands unknown to the pent-up thousands of old countries.

These are the arts and this is the period in which they flourish.

ACTION OF FLUXES.

A flux is a substance which will dissolve a metallic oxide, and will not dissolve the simple metal. Fluxes are employed in two operations.

If a quantity of shot and salt be mixed together in a bowl, the shot will remain scattered through the mixture separate from each other, but if the salt is dissolved by the addition of a sufficient quantity of water, the shot will all collect together at the bottom of the bowl. In the same way, when iron is reduced from the ore in a smelting furnace, it is in small globules or masses, that are held separate from each other and supported by a mass of silica and other infusible substances, which were mingled with the ore. If we bring lime in contact with the silica, the two combine together and become glass, which is melted by the heat of the furnace, and thus allows the small masses of molten iron to sink down through it to the bottom of the furnace. This is the use of a flux in reducing metals.

The other operation in which fluxes are employed is the welding or joining of two metals, or two pieces of metal, together. In this case the flux is employed to dissolve the thin coating of oxide from the surface of one or both metals, in order that they may come into actual contact. Iron has a very strong affinity for oxygen, especially at high temperatures. If two pieces of iron are heated for welding, as they are taken from the fire into the atmosphere, they immediately become coated with a thin film of oxide of iron, which prevents them from welding together; but if a little borax is sprinkled over the ends to be joined, it dissolves this film of oxide, which in the liquid state is squeezed out under the action of the hammer, and the surfaces of pure metal are brought in contact.

This article was suggested by the process of tinning copper sheets which was witnessed at John Trageser's Steam Copper Works, at No. 60 Greene street, in this city. A sheet of copper was first pickled for about two hours in a bath of dilute sulphuric acid, and was then placed on the level surface of a mass of brickwork, in the middle of which was a neat little charcoal fire. The workman pushed the sheet over the fire, and then placed upon its upper surface a small plate of block tin, which was soon melted. As the tin was about to melt, the workman dusted the surface of the copper with salammoniac, to remove any film of oxide of copper either remaining from the action of the pickle, or which might have formed after the sheet was taken from the bath.

In none of the cases does the flux act to melt the metal at any lower temperature, or to render it more fluid, but it permits the metal to flow more freely by removing obstructions from its path.

SPECIAL NOTICES.

Elijah Whiten, of Hingham, Mass., has petitioned for the extension of a patent granted to him on the 30th of September, 1851, for an improvement in sawing volutes.

Parties wishing to oppose the above extension must appear and show cause on the 11th day of September next, at 12 o'clock, M., when the petition will be heard.

Jacob Sendeff of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 13th of January, 1852, for an improvement in metallic heddles.

Parties wishing to oppose the above extension must appear and show cause on the 25th day of December next, at 12 o'clock, M., when the petition will be heard.

Robert Marcher, West Farms, N. Y., has petitioned for the extension of a patent granted to him on the 21st day of October, 1851, and reissued March 15, 1859, for an improvement in machinery for enameling moldings, etc,

Parties wishing to oppose the above extension must appear and show cause on the 2d day of October next, at 12 o'clock, M., when the petition will be heard.

Mary Manny, executrix of the estate of John H. Manny, deceased, of Rockford, Ill., has petitioned for the extension of a patent granted to him on the 23d of September, 1851, and reissued on the 22d of December, 1854, for an improvement in harvesters, (Five cases.)

Parties wishing to oppose the above extensions must appear and show cause on the 23d of September next, at 12 o'clock, M., when the petition will be heard.

MARKET FOR THE MONTH.

The fluctuations in gold and other values during the last month have been less than usual, and less than can be generally expected, so long as our currency remains in its present inflated condition. The dry-goods trade has been active, and stocks are sold out more closely perhaps than ever before. It will be seen by the annexed list that prices of staples were pretty near the same at the beginning and end of June:

	Price May 31.	Price June 28.
Coal (Anth.) ℔ 2,000 lb.....	$9 00	$8 50 @10 00
Coffee (Java) ℔ lb.....33 @	36	24 @ 25
Copper (Am. Ingot) ℔ lb.....	30	29 @ 30
Cotton (middling) ℔ lb.....	51	50
Flour (State) ℔ bbl.....$5 85 @ 6	95	$5 20 @ 6 15
Wheat ℔ bush..... 1 90 @ 2	20	1 70 @ 2 15
Hay ℔ 100 lb.....	1 00	1 00
Hemp (Am.drs'd) ℔ tun..260 00@270	00	260 00@270 00
Hides (city slaughter) ℔ lb. 8 @	9½	7½@ 9
India-rubber ℔ lb.....46 @	75	47 @ 70
Lead (Am.) ℔ 100 lb.....8 25 @ 8	50	9 75 @10 00
Nails ℔ 100 lb.....5 50 @ 5	75	5 00 @ 5 25
Petroleum (crude) ℔ gal....35½@	36	35½
Beef (mess) ℔ bbl.....$10 00 @18	00	10 00 @16 00
Saltpeter ℔ lb.....	25	24
Steel (Am. cast) ℔ lb.....21 @	22	13 @ 22
Sugar (brown) ℔ lb ..... 9¼@	15	9½@ 15¼
Wool (American Saxony fleece) ℔ lb.....75 @	77	75 @ 77
Zinc ℔ lb.....12 @	12½	12 @ 12½
Gold.....	1 37	1 39
Interest (loans on call.....6 @	7	4 @ 5

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ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING JUNE 27, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

48,353.—Stop Washer for Nuts.—H. N. Armstrong, Erie, Pa.:

I claim cutting the edges of the fixed washer and turning up the corners thus formed to hold the nut from being forced back on its thread.

48,354.—Device for Removing Lamp Chimneys.—Geo. Asmus, Houghton, Mich.:

I claim as an improved article of manufacture, a lamp chimney holder, made substantially as herein described.

[This invention relates to a very useful and novel chimney holder, or lamps, with which the chimney can be readily removed from the lamp when in a heated state. without burning the fingers.

48,355.—Furnace for Boiling Iron.—Christopher D. Baker, Wheeling, West Va.:

I claim, First, Placing the iron chamber in the described position relatively to the exit flue for the purpose described,

Second, I claim shelving upwardly the margin of the floor of the chamber in the manner and for the purpose set forth.

Third, I claim shelving outwardly the "chill," or wall of the iron chamber for the purpose described.

Fourth, I claim making the throat or regulating point at the entrance of the neck, so as to limit the reverberation to the chamber itself.

Fifth, I claim making the lower end of the stack flue inclined, and as such leading t wards the flue which connects to the iron chamber, so as to favor the discharge of detritus collecting in the flues, into the said chamber.

[This invention consists in an improved construction of the chill or iron bed, in a peculiar method of locating the chimney aperture relatively to the iron chamber and in an improved structure of exit flue. The improvements insure the more economical working of the iron both in respect to coal saved and in the actual effective influence on the iron itself.]

48,356.—Clasp for Holding Neckties and Shirt Collars together.—Wm. S. Barnes, Watertown, N. Y.:

I claim as a new article of manufacture a clasp for holding the necktie in place on the collar, substantially as described.

[This invention consists in the production of a neat little device, made of gold, silver, or other metal or material, intended for holding a gentleman's or lady's necktie or scarf in proper place on the collar, and it serves as a new article of ornament for both ladies and gentlemen.]

48,357.—Hat.—John P. Beatty, Norwalk, Conn.:

I claim as a new article of manufacture, a hat composed chiefly of straw, and provided with a supplementary brim of enameled paper, made and applied as and for the purposes herein specified.

[This invention consists in the application to the brim of a hat of a supplementary brim of a peculiar character, whereby it is strengthened and made more durable, and also improved in appearance.]

48,358.—Cultivator.—John T. Bever, Bethel, Ill.:

First, I claim the lever handles, I I, consisting uprights, d d, with cross bars, X X, made in solid framing to vibrate upon pivot, P, in combination with beam or tongue, A, and clevis, N.

Second, I also claim the arrangement of the elevating clevis, N, clevis guide, o, cleats or notches, r r, and corresponding notches, s s, as and for the purposes herein specified.

48,359.—Paper Collar.—G. F. Brigelow, Chicago, Ill.:

I claim a turn-down paper collar, made from two or more pieces, one or both or all of which are made of enameled card board or any other material, substantially the same for the purpose, constructed and operating substantially as described.

48,360.—Device for Converting Motion.—F. Brewer, Collinsville, Ill

I claim the employment or use of a toothed segment gearing into a stationary toothed rack, in combination with the piston rod of an engine or other equivalent part, and with the pitman shaft to which a rotary motion is to be imparted, all constructed and operating substantially as and for the purpose set forth.

48,361.—Apparatus for Tanning.—O. H. Brewer, Shannon, Ill., and Wm. Wimer, Freeport, Ill.:

We claim the herein-described apparatus, consisting of the vat, A, chamber, B, pipes, E G H, and valve, F, when these several parts are combined, arranged and operated as and for the purpose herein specified.

48,362.—Rotary Steam Engine.—Harrison T. Briggs, South Bend, Ind.:

I claim the arrangement of the ingress and egress pipes, L M N O, with reverence to the valves, I K, and the adjustable partition, D, and central wheel, G, substantially as herein set forth.

48,363.—Binding Attachment to Harvesters.—Robert D. Brown, Covington, Ind.:

First, I claim the butting board, I, operated as described, for cutting up that end of the sheaf.

Second, The cradle, constructed and operated as described, that is to say, consisting of the stationary part, J, and the double hinged movable part, J, which is raised by means of the cam, K, and jointed slide, L M N, substantially as described.

Third, The arrangement of the spring or springs, j", on the inside of the cradle, for the purpose of adjusting its capacity to varying sizes of gavels, when said spring is employed for opening the said cradle, substantially as described.

Fourth, The combination of the non-rotating gripping fingers, P P, and the rotating gripping jaws, O O, whereby one end of the band is twisted around the other in the manner described.

Fifth, The combination of the sliding mandrel, t, and head, R, with the rotary sleeve, Q, furnished respectively with the toed gripping fingers, P P, and gripping jaws, O O, which, by the protrusion or withdrawal of the mandrel are caused to open and shut in the manner described.

Sixth. The method described of producing the intermittent revolution of the sleeve; that is to say, I claim the combination of the wheel, V, with its pin, v, and the wheel, Y, with its teeth, y, and the sleeve pinion, A, which secures one complete revolution of the sleeve, s, to a revolution of the wheel, V, but periodically and then at a speed commensuraie with the delay due to its intermittent functions.

Seventh, I claim the combination of the pivoted post, a, carrying the pins, d d, or analogous holding devices with the pinion sleeve, e b, carrying a tucking hand, c, so that after advancing to the point where the tuck is to be made, the said sleeve shall be rotated by a rack or other device, which is brought to engage therewith, and the hand caused to push the twist or knot under the band.

Eighth, Pushing the knot under the band by means of a device, which is independent of the sheaf-holding and twisting devices, and which is advanced for that purpose, in connection with a holder, without rotating until it reaches the desired point, when it is caused to rotate to push the knot under the band, while the latter is restrained by the holder from lateral displacement.

48,364.—Attaching Trace to Whiffletree.—Ezra Calderwood. Portland, Maine:

I claim the sliding bars, B B, provided with the pendent lips, e' e', to receive pins or rods, a a, at the ends of the whiffletree, in connection with the sliding slotted plate, C, operated by a lever, E, all being arranged and applied substantially in the manner as and for the purpose specified.

[The object of this invention is to obtain a means for attaching traces to whiffletrees, whereby the horse, in case of necessity, as for instance in running away, may be instantly disconnected, and many accidents, which now occur from that and similar causes, be avoided.]

48,365.—Method of Treating Tan-bark.—James M. Caller, Salem, Mass.:

I claim the process hereinbefore described of producing a solid extract from tan-bark, by steaming, leaching, and subsequent evaporation in vacuo.

[The object of this invention is to assist the tanning of skins of all kinds by facilitating the production of tanning compounds from the various barks commonly employed for tanning purposes. The extract of tannin is first made from the bark, and then evaporated by means of a vacuum apparatus, so as to produce a solid product of tannin. Tanning liquids of any desired strength are made by dissolving the product in water. This process avoids the oxidization of the tannin, and is said to produce a solid extract of much value.]

48,366.—Tremolo Attachment.—R. W. Carpenter, New York City:

I claim the application of means to the instrument, by which the air may be agitated to produce a tremulous note, substantially as described.

48,367.—Process for Distilling Petroleum.—Robert A. Chesebrough, New York City:

I claim the combination of bone dust, pulverized oyster shells and cotton cloth, for purifying, filtering and deodorizing petroleum, naphtha and heavy oil, as herein described.

48,368.—Boot and Shoe.—Edwin Chesterman, Roxbury, Mass.:

I claim a boot or shoe made as herein described as a new article of manufacture.

The object of this invention is to produce a boot or shoe which has all the advantages of india-rubber and leather combined without the objections of either. It is strong, firm, durable, impervious to water, and perfectly dry.]

48,369.—Cloth-guide for Sewing Machine.—Geo. F. Clemons, Springfield, Mass.:

I claim the spring, E, or its equivalent, when applied to a sewing machine, substantially in the manner and for the purpose described.

48,370.—Anchor.—Geo. Coffin, Jamaica Plains, Mass.:

First, I claim the form of the anchor stock herein described, consisting in making its end of a hook shape, with inclined or rounding sides, and with flanged or inclined side edges, either when combined together in one and the same stock, or when used separately, substantially as and for the purposes specified.

Second, Making the end of the shank to which the stock of the anchor is secured, in a forked shape, fastened to and within the stock by means of pins or their equivalents, substantially as described and for the purpose specified.

Third, Hanging the shackle ring to which the anchor is hung to and within the stock of the anchor, by means of a connecting band, arranged and operating as described and for the purpose set forth.

[This invention relates to a novel formation of the anchor stock, and in the mode of connecting it with the shank, whereby many important advantages are obtained, and the efficiency of the anchor much increased.]

48,371.—Arrow Projectile for Ordnance.—Wm. Cousins, New York City:

I claim the combination of the elongated projectile, D E F, and guides, B C, constructed and operating in the manner and for the purpose specified.

[This invention consists in a new projectile, formed of a blade or cutter connected to a ball, whose diameter should be equal to the bore of the ordnance from which it is to be fired, and which is caused to move in a plane level throught its whole flight.]

48,372.—Artificial South Coal.—Richard Covert, Brooklyn, N. Y.:

I claim as a new article of manufacture the artificial lump coal, consisting of coal dust, gas, tar, pitch or artificial asphaltum, and dead or heavy oil mixed by heat and stirring, and aggregated by pressure, as hereinbefore described.

48,373.—Carriage Knob.—R. P. Cowles, New Haven, Conn.:

I claim the herein-described knob as a new article of manufacture.

48,374.—Pen and Pencil Case.—F. W. Cox, Brooklyn, N. Y.:

First, I claim extending the longitudinally revolving and revoking pencil tube, b, throughout the entire length of the case, A, substantially as described, so that long leads can be inserted, and at the same time the tip can be fetched in.

Second, The circular groove, s, in the tube, b, in combination with the pin, j, substantially as herein set forth, so that sufficient hold for the said pin is obtained without the necessity of a cap over the tube, e, and at the same time the pencil tube, b, is prevented from moving in a longitudinal direction.

Third, The collar, o, applied in combination with the tube, f, and shell, h, substantially as and for the purpose specified.

Fourth, The reserve lead chamber, p, extending partially or wholly around the tube, b, and from end to end of the shell, h, as shown and described.

[The object of this invention is to produce a pencil case which is capable of carrying a long lead, and to fetch the point in, and which is provided with a case to carry some reserve leads of the full length. provided the pencil case is not used in cambination with a pen, When the pen is applied the reserve lead case is arranged by the same and cannot be used for carrying lead.

48,375.—Washing Machine.—John Danner, Canton, Ohio:

I claim a roll or cylinder for washing machines, the perimeter of which is covered with india-rubber rings, so as to make a washing or rubbing surface, substantially as herein described and represented.

48,376.—Saw.—Alfred Dawes, Waltham, Mass.:

I claim attaching a saw blade to and within its frame by means of the screw shafts, f and g, handles, l l, and thumb nuts, n, or their equivalents, arranged and operating together substantially as herein described and for the purposes specified.

[This invention consists in attaching a saw blade to its frame in such a manner that it can be turned in any direction desired, and tightened or loosened at pleasure.]

48,377.—Bung for Barrels and Other Vessels.—Austin G. Day, Seymour, Conn.:

I claim providing in the bung or stopper or other part of a cask or other vessel for the transportation or storage of petroleum or other liquids in which vapors or gases are naturally generated a valve which operates automatically, substantially as and for the purpose herein described.

48,378.—Deep Well Pump.—Nehemiah Dodge, New York City:

I claim the slip joint of the lower part of the barrel, in combination with a hollow piston rod, made in the manner and for the purposes herein described.

Second, I also claim the making of the contact part of the valve and valve seat of the section of a sphere, in combination with the cylindrical concave of the under surface of said valve, substantially in the manner and for the purpose set forth.

Third, I also claim, in combination with said valve, hinge pin, substantially in the manner and for the purpose set forth, so that the bearing of the pin against the cylindrical concave of the pump shall hold it firmly in its place.

48,379.—Hydro-Carbon Burner for Cooking and Heating.—H. W. Dopp, Buffalo, N. Y.:

I claim needle point, A', in combination with spindle, A2, perforated plate, C crank pin, sliding block and slot, substantially as shown and described.

Second, I claim the commingling tube, C, in combination with perforated plate, C, arranged and operating substantially in the manner described.

Third, I claim the mode of connecting the retort, B, with reservoir, E, for the purpose described.

Fourth, I claim the application of reservoir, E, for the collection of the residue of hydro-carbon liquids.

Fifth, I claim the use of water or other liquid of suitable specific gravity for the purpose described, but only in connection with hydro-carbon stoves for cooking and heating purposes.

Sixth, I claim the safety valve, J, for the purpose set forth.

Seventh, I claim the draw-off faucet, g2, in combination with reservoir, E, for the purpose herein set forth.

Eighth, I claim supplying vapor to two or more acro-vapor burners by a generating apparatus

Ninth, I claim the retort, B, and feed tube, F, when constructed as and for the purpose set forth.

Tenth, I claim the use of a pipe or tube in connection with a chimney or other apertures for the removal of noxious gases obtained from hydro-carbon liquid, the pendent of combustion, as described and set forth.

48,380.—Sad Iron Heater.—H. W. Dopp, Buffalo, N. Y.:

I claim the acro gas burner, B and B'1, as constructed and for the purpose described.

I claim the regulating screw, A1, in combination with commingling tube, B1, substantially as and for the purpose described.

I claim the slot, or its equivalent, in the upper part of said iron, for the purpose set forth.

48,381.—Wagon.—James Dowd, Boston, Mass.:

I claim the combination of the oil-holding channel, f, with the tubular pivot, d, and step, e, applied to the rocker plates, and the transom bolt, as specified.

Also the combination of the slider, L, with the spring and wagon, body or truck, in manner and so as to operate substantially as described.

Also the combination and arrangement of the auxiliary or tie bars, c c, with the truck, F, and the springs, H H, and their sliders I I, applied thereto substantially as explained.

48,382.—Mode of Reclaiming Marsh and Swamp.—Spencer B. Driggs, New York City,

I claim the construction of a wall impervious to water for the reclamation of swamp or marsh lands on the shores or banks of the sea, bays, lakes, rivers, creeks, or other waters, by the insertion into ground, at a suitable distance from the margin of the shore or bank, of a series of iron plates, with water-tight joints, extending to a suitable hight above the surface of the ground to shut out the ordinary tidal or other flood, substantially as herein specified.

48,383.—Nut Machine.—George Dunham, Unionville, Conn.:

I claim the sliding plate, o, operated by the plate, d, with its inclined edges, for gaging the width of the bar just before the blank is cut therefrom, substantially as described.

Second, I claim the combination of the conical shape recess, Q, with the spring or yielding table, P, substantially as and for the purpose described.

Third, I claim the employment of the lifting holders, S S', substantially in the manner and for the purpose described

Fourth, I claim the clearer bar, A, for holding, clearing and carrying the nut from one point to another, substantially as described.

I claim forming a screw upon the upper end of the punch, k, in combination with the threaded socket, i, substantially as described.

48,384.—Hat.—Robert Dunlap, Yew York City:

As a new article of manufacture, I claim a head covering with its side made of two thicknesses of woven or knitted material, formed upon a block and cemented together with gutta percha or india rubber by the aid of wet heat, as herein specified.

[This invention consists in a novel construction of hats and caps wherein the crown of a hat and the body of a cap are severally made of an outer cloth and an inner cloth, united together after they are formed by means of gutta percha or its equivalent.]

48,385.—Manufacture of Printers' Ink.—George Duryee, New York City:

First, The improved ink prepared of the materials and in the manner substantially as herein set forth and described.

Second, I claim as a basis for the manufacture of various kinds of printers' ink the material derived from the residuum of petroleum, and herein designated as petroline wax, the same to be used substantially as set forth.

48,386.—Carriage Top.—Joseph Enders, Louisville, Ky.:

First, The pillars, E, and open rings, F, or their equivalents, formed by the rear ends of the rail, B, in combination with braces, I, lazy back, D, and top, C, constructed and operating substantially as and for the purpose set forth.

Second, The hooks, d, and catches, e, in combination with the rail, B, and straps, J, secured to the seat, A, substantially as and for the purpose specified.

[An engraving and description of this invention has been published on page , Vol. XII. New Series, SCIENTIFIC AMERICAN.]

48,387.—Plow.—Valentine Felkner, Cannel, Me.:

I claim elbow, C, upright, D, and lever elbow, b combined and arranged to operate substantially as and for the purpose set forth.

I further claim rod, G, lever, H, truck, g, and adjustable collar, j, when arranged and combined to operate substantially as described; whereby the depth of the furrow is not only controlled but the direction of movement of the truck, g, always corresponds to the line of draft.

I further claim the arrangement of the plow holder, as constructed of parts, C D B and b, attached to plow, A, with plow governor, G H g and j, operating as described and for the purposes set forth.

I also claim the combination of two plows in one gang, when combined and arranged to operate substantially as and for the purposes specified.

48,388.—Boring Artesian Wells.—W. A. Fisher, Lower Merion, Pa.:

I claim, First, The drill, B, composed of two or more detachable sections, each having a cutting edge, and the whole being arranged and secured together by the within described devices, or their equivalents, substantially as and for the purposes specified.

Second, A drill, with a central straight cutting edge, x, and a curved cutting edge, y, at each side of the same, arranged in respect to each other as described.

Third, The tube, D, combined with the casing, A, drill, B, and its valve, substantially as and for the purpose specified.

Fourth, The case, A, its cross piece, F, and drill, B, in combination with the sliding rod, F, and its plate, h, all being arranged and operating substantially as and for the purpose described.

48,389.—Postage and Revenue Stamp.—Samuel Ward Francis, New York City:

I claim incorporating with or applying on to stamps, either before or partially before and partially after being used, ingredients such as will chemically combine to produce a dark color or stain under the action of moisture, substantially as and for the purpose set forth.

48,390.—Puddling Furnaces.—William and John Groves Providence, R. I.:

We claim the employment or use of fire chambers on opposite sides of the body of the furnace, substantially as specified.

48,391.—Apparatus for Carbureting Air.—Frederick Hainsworth, Chicago, Ill.:

First, I claim the combination and arrangement of the regulating cock, M, provided with a diagonal series of perforations, c, with the dial and pointer, as and for the purposes herein specified and shown.

Second, I claim the peculiar arrangement of the vertical porous partitions, B, with the ducts, b, leading from the pipe, C, operating as specified and described.

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Third, I claim, in combination with the carbureter, A, the employment of the fan, H, and regulating cock, M, with the dial and pointer, arranged and operating as described.

48,392.—Broom Head.—Caleb C. Hand, Cincinnati, Ohio:

I claim the parts, A B E F G H J and K, in the described combination, for the purpose set forth.

48,393.—Sleeping Car.—Charles Thompson Harvey, New York City:

I claim, First, The adjustable standards, D, whether solid or hollow, either surrounded by, or, if hollow, inclosing within, spiral or other form of springs, combined with the berth of a sleeping car, in the manner and for the purpose herein set forth.

Second, The combination of the air tube, G, tube, h, flexible tubes, H, and air valves, I, when used in connection with the berth of a sleeping car, for the purposes of ventilation, in the manner and for the purposes herein described.

Third, I also claim suspending and nesting the berths upon the upper sockets, or upon the parts which constitute the upper portions of the standard of the berths when the berths are out of use, substantially as described.

Fourth, I also claim supporting the berths upon adjustable elastic bearings, when in use as shown at D, in Fig. 2, substantially as described.

Fifth, I also claim preventing and controlling violent oscillations and noise from the movements of the berths on their standards and sockets by means of elastic diaphragms or rings, when combined with the bottom of the berth, substantially as described.

Sixth, I also claim applying elastic curtains to adjacent berths, so that the same will yield and conform to the motion of the supporting springs thereof, so as to isolate the berths from the common passageway and from each other, substantially as described,

48,394.—Gold Beating Machine.—Matthew Hastings, Philadelphia, Pa.:

I claim, First, The employment for beating gold of a vertically-guided hammer, which is raised and permitted to fall with uniform face by the mechanism herein described, or the equivalent to the same.

Second, The shaft, K, with its arms, L, the rock frame, H, and cam, F, the whole being arranged for joint action on the rod, F, substantially as and for the purpose herein set forth.

48,395.—Machine for Cutting Paper into Sheets.—Jonathan Hatch, South Windham, Conn.:

I claim the crank, L, slotted lever, E, slide, D, band, C, clutch, A3, pulley, A4, lever, H, and cam, F, in combination with each other and with the feed rolls of a paper-cutting machine, substantially as and for the purpose herein specified.

48,396.—Manufacture of Malt Sirup.—Thomas Hawks Rochester, N. Y.:

I claim the method and process of producing a sirup of sugar from malt and meal of Indian corn substantially as herein described

I also claim as a new product a sirup of sugar produced from malt and the meal of Indian corn without any separation of the fecula thereof, substantially as set forth.

48,397.—Sorghum Evaporator.—Samuel Heaton, Kingston, Iowa:

I claim, First, The levers, E E, constructed in the manner and for the purposes specified, substantially as set forth.

Second, The cross bar, D, constructed in the manner and for the purposes specified, substantially as described.

Third, the swinging hooks, g g, constructed in the manner and for the purposes specified, substantially as described.

Fourth, In combination with an evaporator, the levers, E E, the cross bars, D, and the hooks, g g, constructed and operated substantially as and for the purposes herein specified.

48,398.—Composition for Lining Barrels.—Ludwig Held, Harlem, N. Y.:

I claim, First, The within described composition when the same is applied in combination with carbonate of lime, substantially as and for the purpose set forth.

Second, The within described composition when applied in combination with carbonate of lime and graphite brown spar, copperas or other material containing iron particularly as a lining for barrels or other vessel.

48,399.—Fruit Jar.—Robert Homingray, Cincinnati, Ohio:

I claim the peculiar form of the neck of the jar from the spiral shoulders gradually contracting to the top, as herein shown and described

48,400.—Railroad Frog.—Gibbons G. Hickman, Downington, Penn.:

I claim the rail, B, applied and secured in such a manner as to be caused to assume its normal position by the influence of gravity after it has been moved by the wheels of a passing train and also adapted to be retained in position by the pressure of the wheels when the latter are running upon it, substantially as herein described and represented.

48,401.—Pump.—Benjamin S. Hill, New York City:

I claim, First, The cylinder having openings, f f, combined with the piston, P, and arranged in relation to the discharge pipe, H, substantially as and for the purpose herein specified.

Second, Combining the discharge pipe, H, with the piston by means of the cap, G, of the cylinder, C, and the pipe, F, the latter pipe serving also as a means of securing the cap, G, tightly to the cylinder, C, and of forming an air-tight chamber, e, within the said cylinder, all substantially as herein specified.

Third, The combination and arrangement of the piston, P, cylinder, C, chamber, E, and discharge pipe, H, substantially as herein specified.

48,402.—Washing Machine.—W. R. Hill, Detroit, Mich.:

I claim the lower disk, fastened and constructed as described, and acting as a washboard and a filter.

Second, The combination of the central part, stepped into the stud as described, and having the two shoulders which act respectively upon the washboard disk and the rubber disk, to maintain them in their relative positions.

[This invention relates to a washing apparatus of very simple construction, which is adapted to be placed within a common tub of any size, therein to perform its work.]

48,403.—Straw Cutter.—Edward F. Holloway, Kngstown, Md.:

I claim the combination and arrangement of the knife, F, shaft, C, coiled spring, S, collar, I, metal frame B, box, A, fly wheel, G, and guard, P, substantially as shown and described.

48,404.—Ambulance.—Benjamin Howard, New York City:

I claim the combination of transverse seats and sliding litters or beds resting on a frame placed within the body of the vehicles, supported and balanced by counterpoise springs within the body of the vehicle. This, I claim, together with the compartment for the beds beneath the main floor of the body of the vehicle, in which the litters or beds may be placed for convenience, when not in use, as in the manner described above.

48,405.—Beverage.—A. C. Howell, Vienna, N. J.:

I claim the drink composed of the material and prepared in the manner substantially as herein described.

48,406.—Extracting Turpentine and other Products from Resinous Wood.—Duane Hull, Newburgh, N. Y.:

I claim the distillation of pine or other resinous wood for the purpose of obtaining spirits of turpentine or other products, under reduced pressure, or pressure less than the atmosphere, substantially as herein set forth and described.

48,407.—Self-closing Cock.—Nathaniel Jenkins, Boston, Mass..

I claim, First, The screw follower, H, in combination with the valve or self-closing lancet, substantially as set forth and for the purpose described.

Second, The combination of the swivel, P, screw follower, H, valve, K, and spring, O, substantially as and for the purpose described.

48,408.—Electro-phonetic Telegraph.—Royal E. House, Binghamton, N. Y. Patented in England July 21, 1864:

First, I claim in combination a magnetized neeele or helix, and an adjustable torsion suspention apparatus existing both above and below the needle the combination being substantially such as is described.

Second, The combination with a magnetized needle suspended by torsion wire or thread, I claim limiters for limiting its motion and which give sounds when struck by the needle, the combination being substantially such as described, and in combination with these a gong or bell, substantially as specified.

Third, I claim in combination with a torsion suspended magnetized needle a knife edge applied to the needle and acting substantially as set forth, and also in combination with a magnetized needle, a knife edge and limiters, arranged with reference to the needle, substantially as described.

Fourth, I claim a suspension torsion apparatus consisting of wires or threads attached to collars or rings as described in combination with a magnetized needle supported in the collars, substantially as described, and also a magnetized needle in combination with a torsion suspensory apparatus both ends of which can be adjusted as set forth and also a magnetized needle, in combination with a torsion suspension apparatus both ends of which can be adjusted at once by reason of being geared together, both these combinations being substantially as set forth, and also in combination with a magnetized needle an adjustable torsion suspensory apparatus extending both above and below the needle and having one thread or wire attached to a weight, substantially as described so as to compensate for the varying length of the wire.

Fifth, I claim a magnetized needle, in combination with limiters, and a gong or bell and concentrating cone and in combination with these an outer cone all these parts being substantially such as set forth; and also a sounding apparatus consisting of a bell and a trunkated concentrated cone arranged with reference to each other as described and in combination with such an apparatus an outer concentrating cone arranged with reference to a ball and interior cone, as described.

Sixth, I claim sections of a helix composed of members connected to and insulated from each other substantially as set forth.

Seventh, I claim a helix made up of sections of varying diameter insulated from each other as described.

Eighth, I claim a helix made up of sections connected to and insulated from each other as set forth.

Ninth, I claim a helix made up of sections composed of members when both the members and the sections are connected to and insulated from each other, substantially as set forth.

Tenth, I claim a helix made of decreasing area to the ends as described, and also a divided helix or helix made in two parts, so that one part may readily be moved away from the other and also a divided helix in combination with a divided case, all substantially as specified.

Eleventh, I claim apparatus substantially such as is described for registering the power or force of reaction in combination with a telegraph line and a signalizer whereby the locality of excessive leakage may be determined as described.

Twelfth, I claim a helix making part of a signalizer in combination with branch lines, and ends of a main line capable of being advanced toward and drawn away from each other, the combination being as described.

Thirteenth, I claim a helix making part of a signalizer in combination with branch lines and ends of a main line capable of being operated as described and with tubes containing liquid as described whereby varying amounts of currents of electricity may be caused to pass through a helix, substantially in the manner and for the purposes specified.

Fourteenth, I claim in combination a helix making part of a signalizer, branch lines or conducting wire, an electric adjuster located between the points where the branch wires are connected to the main wire, and a key or circuit breaker also located between the points where the branch wires are connected to the main line and operating when open to send the whole current through the helix.

Fifteenth, I claim a helix making part of a signalizer and united to a main line by branch lines or wires, substantially as described in combination with an electric adjuster in connection with or making part of a main line and located between the points where the branch lines are connected with the main line as described whereby the relative proportions of electricity passing through the adjuster and the helix may be governed and regulated as described.

Sixteenth, I claim a helix of a signalizer in combination with a line by means of a tube an adjustable severed wire as described when the wire is provided with a register or index as set forth whereby the condition of a helix or of the batteries that work the line may be tested in the manner specified,

Seventeenth, I claim an apparatus substantially such as is described whereby the apparatus for adjusting torsion, and the apparatus for adjusting the relative position of the ends of a main line may be put in operation at the same time, substantially as set forth.

Eighteenth, I claim in combination with a line a series of helices differing in size at each station thereof and proportioned each to the other in proportion to the length of line between each helix and the most distant extremity thereof, the combination being substantially as set forth.

Nineteenth, I claim the new telegraphic signalizer herein described composed of a helix, a torsion, suspended magnetised needle, limiters and a bell and concentrating apparatus, all substantially such as herein before specified.

Twentieth, I claim in combination with a helix, making part of a signalizer and connected to a line by branch wires a key or commutator located in the line and capable of breaking the current through both the main line and the branch wires the combination being substantially such as described.

And finally, In combination with an ordinary protector such as is described applied to the ordinary wire of a line, I claim a protector such as is specified applied to a line wire inserted in and making part of the main line for the purposes specified.

48,409.—Lathe for Turning Tool Handles.—H. K. Jones, Kensington, Conn.:

I claim, First, The spindle, f, provided with spurs, and arranged in a revolving head, b e, and operating in combination with the longitudinally sliding centers, k, in the revolving drum, E, substantially as and for the purpose set forth.

Second Giving to the spur centers a sun and planet motion by means substantially such as herein described, for the purpose set forth.

Third, Giving to the centers, k, an automatic reciprocating motion by means of a spring and cam or other equivalent means, substantially as and for the purpose specified.

Fourth, The pins, t, and hook, s, applied in combination with the trough, F, and centers, k, substantially in the manner and for the purpose described.

Fifth, The use of stationary cutters, G I, in combination with the centers, f k, arranged in revolving heads, substantially as and for the purpose set forth.

48,410.—Carpet Fastener.—J. O. Jones, Boston, Mass.:

I claim the application and arrangement of the above-described apparatus, substantially in manner and to operate as before described.

48,411.—Tea Kettle.—Anthony Kipp, Brooklyn, N. Y.:

I claim the tea kettle above described, the lower half of the kettle, including the spout, being made of copper, and the upper part above the spout and line, C, being made of tin, as a new article of manufacture.

[This invention has for its object an improvement in tea kettles, meaning thereby those covered vessels used for boiling water which have sunken bottoms that fit in boiler holes of stoves and flanges, and which have spouts for pouring water thereinto.]

48,412.—Hat Frame.—Albert Komp, New York City:

I claim a hat frame composed of a series of arched stays, B, radiating from a common center, and fastened to a ring, A, substantially as set forth.

[This invention consists of a hat frame, composed of a series of arched stays rising from a ridge, made of curved metal wire in such a manner that a light, cheap and durable article is produced which, when covered, produces a hat of superior beauty.]

48,413.—Process for Making Beer.—Ernst J. Krause, Lancaster, Pa.:

I claim the mode of manipulating or process for making bottom fermenting beer, as herein set forth and distinctly specified.

48,414.—Hoisting and Lowering Apparatus.—Isaac J. Lancaster, Vancouver, W. T.:

I claim the employment in connection with a ratchet wheel and windlass, of pawls, D D', springs, G G' d, a retainer, H, and lever, E, the whole being arranged and operating substantially in the manner and for the purpose set forth.

48,415.—Breeching Hook.—Joseph H. Littlefield, Cambridge, Mass.:

I claim the hook, A, with its swell, D, and slot, I, the standard, B, with its tongue or continuation, C, and the spring, F, all constructed, arranged and combined substantially as described and for the purposes set forth.

48,416.—Whiffletree.—Joseph H. Littlefield, Cambridge, Mass.:

I claim the combination of the ferrule, B, having its guard, h, and socket, k, the hook, C, having its lever, l, spindle, i and pin, p, the spring, D, and the cord and chain, F and E, or their equivalent, all arranged substantially as described and for the purposes set forth.

48,417.—Apparatus for Attaching Mourning Badge to Hat.—Thomas H. Lowerre, New York City:

I claim the implement herein described for securing bombazine to hats.

[This invention relates to a novel and useful tool for securing mourning badges to and around hats, by the use of which it is accomplished with great facility and ease, and without injuring the hat in the least degree.]

48,418.—Valve Gear of Steam Engine.—J. W. Maloy, Boston, Mass. Antedated June 9, 1865:

I claim actuating the link that forms the communication between the eccentric rod and sliding-valve rod, by means of an auxiliary steam cylinder and piston, when supplied with steam by the movement of the regulator rod, as set forth.

48,419.—Brick Machine.—Henry Martin, Springfield, Mass.:

I claim, First, The slotted levers, i2 i2, and cogwheel, i t, or their equivalents, in combination with the gate, f plunger, d, mixing box, A, and press box, C, constructing and operating substantially as and for the purpose set forth.

Second, The adjustable tapering slide, i4, in combination with the lever, i2, pins, i3, or its equivalent, and plungers, d, constructed and operating substantially as and for the purpose described.

Third, The rising and falling slide or gate, m, in combination with the press box, C, constructed and operating, substantially as and for the purpose specified.

Fourth, The pusher, E, arms, f, and rock shaft, e, in combination with the roller platform, D, and with the mold constructed and operating substantially as and for the purpose set forth.

48,420.—Bracket.—Maurice H. Matsinger, Philadelphia, Pa.:

I claim the plate, A, with its sockets, c and c', the whole being constructed and adapted for the reception of a rod or staff, substantially as described.

48,421.—Faucet.—John Matthews, Jr., New York City:

First, In combination with a flexible lining tube, C, applied within the passage of a cock or faucet, I claim a stopper, the operation of which is so controlled by a spring as to compress and close the said tube, C, automatically, substantially as herein specified.

Second, I claim the combination of the flexible lining tube, C, stopper, D d d e, fixed diaphragm, a, spring, E, and cap, F, the whole applied in relation to each other, and to a cock or faucet, to operate substantially as herein specified.

48,422.—Instrument for Opening Bottles.—John Matthews, Jr., New York City:

I claim, First, An instrument for opening and holding open the inwardly closing stopper of a bottle, consisting of an internally operating device for pressing back the stopper from its seat, and an attached externally operating means of holding the said internally operating device in position, to keep the stopper open, substantially as and for the purpose herein specified.

Second, The combination of the collar, A, tube or hollow hub, C, elastic packing ring, D, and spring clasps or clips, B B, substantially as and for the purpose herein specified.

48,423.—Breech-loading Fire-arm.—Edward Maynard, Washington, D. C.:

I claim the combination of the retaining spring, S, with the plunger, B, in the hinged block of a breech-loading musket or other fire-arm, when the said spring is contained in a hole extending from the under side of the breech block to the aperture in which the plungers work, substantially in the manner and for the purpose herein set forth,

48,424.—Molding Machine.—Josiah F. Melcher, Bloomington, Ill.:

I claim, First, Forcing a stream of water through or upon the articles to be washed simultaneously with the operation of the plunger, and in a contrary direction to the movement of the plunger, by means substantially as described.

The valves, b h, and chamber, D, in combination with a perforated washboard, C, and a plunger, G, substantially as described.

Third, The combination of a reciprocating plunger, G, a water passage, D, and a perforated washboard, C, substantially as described.

48,425.—Grate.—James Miller, St. Louis, Mo.:

I claim the combination and arrangement of the horizontal tubular or hollow grate bars, b b, with the lateral chambers, A A, substantially in the manner and for the purpose herein set forth.

48,426.—Automatic Stop Motion for Steam Engines.—Alexander Nadow, Springfield, Mass.:

I claim the rod b, in combination with the fly wheel, A, and suitable mechanism for closing the valve, substantially as described

48,427.—Bung for Barrels.—C. A. Neuhaus, New York City:

I claim a bung provided with a tubular plug, c, spring valve, d, and lever, B, substantially as and for the purpose set forth.

[This invention consists in a bung provided with a cone valve, the seat of which is in a tube screwed in the bung, in combination with a spring, which has a tendency to keep the valve tight in its seat, and with a lever, by means of which the valve can be opened in such a manner that whenever it is desired to draw some of the contents of a barrel the requisite supply of air can be admitted simply by depressing the lever, and as soon as the lever is released the valve closes hermetically, and the gaseous constituents of the contents of the barrel are not allowed to escape.]

48,428.—Wood Turning Lathes.—G. H. Ober, Newburgh, Ohio:

I claim, First, The rack, L, stop, r', and shaft, E, in combination with the lever, r, catch, j, screw, g', and adjustable carriage, G or H, substantially as and for the purpose set forth.

Second, I claim the special arrangement of the spring, I, cluth, g', and shifter, T, in combination with the shaft, E, and adjustable carriages, G or H, as herein described, for the purposes set forth.

48,429.—Ash Sifter.—John H. O'Neil, Pittsburgh, Pa.:

I claim as an improved article of manufacture the ash sifter constructed with its entire side and bottom of wire cloth, and provided with feet, b b b, and handles, c, all as herein described and for the purposes set forth.

[This invention relates to a new and improved ash sifter, constructed of wire cloth and in the form of a pan, so that it may be fitted under the grate of a fireplace and receive the ashes and cinders from the former, the ashes being allowed to pass through the sifter, while the cinders are retained within or upon it.]

48,430.—Three Way Cock.—F. S. Pease, Buffalo, N. Y.:

I claim the rotary valve, K, with the through port, M, rotating in a casing provided with parts which connect on one side with the chamber of condensed air, A, with the vacuum chamber, A, and with the exhaust opening, E, and on the other side with corresponding opposite ports, which connect with the well pipe, I, all substantially as and for the purpose described.

48,431.—Gas Fitter's Clamp.—John Peace, Camden, N. J.:

I claim as an improved article of manufacture a gas fitter's clamp, made substantially as herein shown and described.

[This invention relates to the construction of gas or steam fitters' pipe clamps in such a manner that the pipe inserted therein can be brought to the most convenient position for operating upon it, while at the same time it is firmly gripped and held.]

48,432.—Grain Drill.—Warden P. Penn, Jacob Geiss and Jacob Brosins, Belleville, Ill.:

We claim the arrangement consisting of the slide, C, fixed plates, d, with check pieces, c2, and movable plates, d1 d2, in combination with the hopper, all constructed and arranged in the manner and for the purpose described.

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Second, The construction of the agitating slide with double beveled projections, e' e', and clearing pins, e2, in combination with the divisions, a a, vibrating hangers, D3, and seed-distributing devices shown, substantially as and for the purposes set forth.

Third, The long cut-off plate, d2, arranged with the plates, d d', and slide, C, and connected with the drill teeth by means of the pivoted vibrating bar, E, and claims, g, and operated by a handle, E, all in the manner and for the purpose described.

Fourth, The slotted hinge braces, h, applied to the drill tooth, G, and its bar, H, in the manner and for the purpose described.

Fifth, The pendent stand board, J, arranged substantially as described, upon a seed drill, for the purpose set forth.

48,433.—Seed Drill.—W. B. Porter, Farmer City, Mo.:

I claim the combination with the furrow openers, G, and wheels, H, provided with beveled edges of the rollers, D, substantially as and for the purposes herein described.

48,434.—Broom Head.—Thomas H. Powers, Milwaukee, Wis.:

I claim forming the edge of the conical or other suitable socket plate, in and by which the upper portion of the broom corn is held of a flange shape, substantially as herein described and for the purpose specified.

I also claim the D-shaped nut, having its edges serrated or toothed, and arranged substantially as set forth and for the purpose specified

[This invention relates to the manner of securing broom corn to the handle of the broom, whereby it is held with great tightness and security, the advantages of which are manifest.]

48,435.—Apparatus for Distilling Petroleum.—Elijah Freeman Prentiss and Robert Adam Robertson, Philadelphia, Pa.:

We claim, First, The employment of the bent vapor, steam and air pipes, a b and c, arranged, constructed and operating substantially as shown and described.

Second, Constructing the column so as to have a space, I, unobstructed with pipes for the free boiling of the oil, substantially as shown and described.

Third, Constructing the column, so that the head, K, shall form a part thereof, the same being arranged, constructed and operating in the manner and for the purpose substantially as shown and described.

Fourth, The slotted pipe or trough, L, in combination with the column, whereby the cooler oil is fed in and distributed equally over the pipes, arranged and constructed substantially as shown and described.

48,436.—Apparatus for Distilling and Rectifying Whisky.—Elijah Freeman Prentiss and Robert Adam Robertson, Philadelphia, Pa.:

We claim, First, The employment of chamber, A, constructed substantially as described, and having a separate regulator, so that the said chamber can be maintained at any desired temperature lower than that of chamber 2, for the purpose of more effectually dehydrating the alcohol.

Second, The employment of boxes, R1 R2, etc., attached to the upper shelves in chamber 4, in the manner and for the purpose substantially as described.

Third, The trough, e', in combination with the pipe, e, and chamber, A, arranged, constructed and operating substantially as described.

48,437.—Melodeon.—Peter J. Peretz, Milwaukee, Wis.:

First, I claim the arrangement of closing and operating the reeds at F and H by means of shutters, J and G, and operated by arms, d and h, fast to a shaft, K, when arranged and operating in the manner substantially as described.

Second, I claim operating the shaft, K, by means of a lever, f, acted upon by the said knee of the player in such a manner as to open either one set of reeds or both sets, as may be desired, substantially as set forth.

48,438.—Process for Refining Metal.—John Ramdohr, Virginia City, Nevada:

I claim the within described process of refining the amalgam of gold and silver, commonly known as crude bullion, said process consisting of three subsequent manipulations, substantially such as set forth.

[Gold and silver amalgam, such as is commonly called crude bullion, contains principally gold, silver, copper, zinc and iron, and the object of this invention is to separate the base metals from the gold and silver.]

48,439.—Artificial Fuel.—Henry Redlich, Chicago, Ill.:

I claim the within described combination of the ingredients above specified, and mixed together, substantially in the manner and about in the proportion set iorth.]

[This invention relates to an improved method of aggregating coal dust, or waste coal, and also sawdust and other similar combustibles, by mixing them with a certain percentage of cow manure, with or without blood, and compressing the mixture so as to drive out all moisture, and to produce cakes of the required form and consistency.]

48,440.—Substitute for Artificial Hands.—John Reichenbach, Pittsburgh, Pa.:

I claim the use of a pair of pincers, constructed substantially as described, attached to a case to be worn over the stump of the arm which has lost the natural hand, and operated by means of a cord attached to the arm above the elbow, as a substitute for an artificial hand.

Also, the combination of the pincers and hook, constructed substantially as described for the purposes hereinbefore set forth.

48,441.—Wheat Drill.—William Rice, Concord, Ill::

I claim the combination of the frame, A, pivoted frames, E E, wheels, B G, and furrow cutters, H, all constructed and arranged to operate as specified.

48,442.—Washing Machine.—M. A. Richardson, Sherman, N. Y.:

I claim, First, The adjustable apron, I I, in combination with the elastic spring, K, and the wooden springs, G G, constructed and operated in the manner and for the purposes specified, substantially as set forth.

Second, In combination with a washing machine constructed with two adjustable aprons, which are connected by an elastic spring and a series of rollers resting upon wooden springs, as represented, the clothes box, M, constructed and operated in the manner and for the purposes specified, substantially as set forth.

48,443.—Binnacle.—E. S. Ritchie, Brooklyn, N. Y.:

I claim the combination of one or two lenticular prisms or the equivalent or equivalents therof with a binnacle and its lamp, substantially in the manner and for the purpose of illuminating the compass, or part of the same and a part of the compass box, as specified.

I also claim the binnacle lamp as made with a recess in its side to cause it to rest on the bottom of the lamp chamber and fit around the prism case, as specified.

I also claim the combination as well as the arrangement of the prism case, D, and the light-discharging passage or mouth, E, with the binnacle chamber and the lamp chamber, as specified.

I also claim the combination of the movable shutter or screen, O, and its operative mechanism with the lamp, the lenticular prism, and its case, and the lamp and binnacle chambers arranged substantially as described.

48,444.—Carriage Spring.—Andrew J. Ritter, Rahway, N. J.:

I claim the double side spars, A a A a, or their equivalent, in combination with the thorough braces, K K, cross bars. I L, axle, c', and axle bars, F F, for the purpose herein set forth and specified.

48,445.—Cultivator.—Cyrus Roberts, Three Rivers, Mich.:

I claim, First, The combination of the plow beams with the flaps and stay rods, substantially in the manner described for the purpose set forth.

Second, The combination of the frame, the movable, driver's seat, and the plows, substantially as and for the purpose described.

Third, The combination of the adjustable driver's seat and hand lever with the adjustable link-rod, s, as and for the purpose described.

Fourth, The combination of the frame, the driver's seat and the plows with the rear flap and stay rods, substantially as described, whereby the device can exert his whole weight in raising the plows, as set forth.

Fifth, The combination of the frame and driver's seat with the shifting plows and elbow-levers when arranged and operating as described.

Sixth, The combination of the plow beam, and stay rod with the hinged socket and wooden pin, when arranged and operating as described, for the purpose set forth.

48,446.—Water Door for Furnaces.—Joseph Rogers, Nashua, N. H.:

I claim as an improved article of manufacture a door for furnaces provided with internal tubes to form a water-passage through them, substantially as and for the purpose herein set forth.

48,447.—Jack for Holding Shoes.—John Ross, Philadelphia. Pa.:

I claim, First, The combination of the pin rack and pawl and sliding block and pad arranged substantially as set forth and described.

Second, The combination of the swivel, G, plate, M, and base, L, arranged and used substantially as drawn and described.

Third, The combination of the swivel, G, joint, J, and rotating bearing, K, when arranged, substantially as set forth and described.

48,448.—Heel Shave.—John Ross, Philadelphia, Pa.:

I claim the adjustable blade combined with the adjustable guard of heel shaving tools when constructed and operating substantially in the manner herein before set forth and specified.

48,449.—Churn.—J. F. Sanborn, Hardwick, Vt.:

I claim, First, The arrangement of revolving staves or beaters which are adapted for producing butter from cream, and then working the butter, in conjunction with the obliquely ribbed concave, substantially as described.

Second, The combination of the long and short beaters or staves, d d and e e, which are grooved and ribbed, with the oblique ribs. b b, and plain portions of the churn bottom, substantially in the manner and for the purpose described.

Third, The arrangement of the ribs, h h, upon the surface of the concave bottom of the churn box, so that these ribs all incline toward the center of the bottom of the box and toward one end thereof, substantially as described.

48,450.—Kerosene Oil Burner.—Hugh and James Sangster, Buffalo, N. Y:

I claim, First, Constructing the spring, E, so that it connects the burner to the collar, B, by pressing it down into said collar, and turning it around until it springs over either corner, J or J', into the notch, K, thus bringing the spring under the lower edge of the collar.

Second, In so constructing the lower part, A, of the collar, B, that when the burner is turned, so that the spring passes the corner, J, it is forced into the case, A, and allows the burner to be drawn out easily.

48,451.—Meat Chopping Machine.—George W. Sargent and Plumer H. Chesley, Chelsea, Mass.:

We claim the arrangement of the crank shaft, a, the application of the chambers, n, on the knife rods, b, the diagonal position of the knives, and the operation of the satchel in the manner and for the purpose as described.

48,452.—Steam Cock.—James B. Sargent and Francis W. Towne, Fitchburg, Mass.:

We claim as our invention an improved steam cock made as described, viz, not only with the lifting screws, arranged with or applied to the stem of the valve and the cap, B, as set forch but with the valve stem provided with a key socket, k, to receive the key head, l, as specified.

We also claim the combination and arrangement of the wooden anuli, r s, and the flange, q, with the stem, C, the chambered cap, B, and its screw cap nut, E.

We also claim the combination of the auxiliary guide, g, and the socketed projection, h, with the case, A, the valve, f, and its lifting screws and key, C, arranged with respect to it as described.

48,453.—Mode of Renewing the Surface of Printer's Rolls.—Charles Sentell, Waterloo, N. Y.:

I claim removing the hardened surface of printer's rolls, and recoating the same, by placing them in the mould, C, and turning the melted material around them substantially as herein set forth.

48,454.—Ruler.—S. L. Simpson, New York, N. Y.:

I claim the spring stop, d, applied in combination with a ruler A', substantially as and for the purpose set forth.

48,455.—Grate for Steam Boiler Furnaces.—George L. Smith, Brooklyn, N. Y.:

First, I claim a grate surface formed of a series of sections upon which the fuel is placed in combinalion with a series of disconnected supports or trusses and traverse bearers, substantially in the manner and for the purposes herein set forth.

Second, A grate divided into sections by longitudinal and traverse divisions in combination with a series of disconnected supports or traverses and traverse bearers and a grated surface substantially as and for the purposes described.

Third, The combination of disconnected supports or trusses with taper upper edges, traverse bearers and a grated surface, substantially as and for the purposes set forth.

Fourth. Trusses or supports for a grated surface made free from the grated surface and from the transverse bearers, substantially as and for the surposes set forth.

Fifth, So arranging the sections and the trusses or supports of a sectional grate, that each section will be supported and balanced, substantially in the manner described.

48,456.—Cooling Air in Buildings and Chambers.—Dan. E. Somes, Washington, D. C.:

I claim, First, Constructing submarine buildings, tanks or chambers, substantially as described and for the purposes set forth.

Second, Ventilating submarine buildings, tanks or chambers, substantially as described and for the purposes set forth.

Third, Cooling air by means and for the purposes herein set forth.

Fourth. Cooling tanks and their contents in the manner herein specified.

Fifth, Constructing and ventilating buildings, chambers or tanks below the surface of the earth, for the purpose and in the manner herein set forth.

48,457.—Cooling and Ventilating Ships and other Vessels.—Daniel E. Somes, Washington, D. C.:

I claim, First, Constructing canal boats and other vessels, with tubes or air ducts extending below the deck, and in a diagonal position with it.

Second, Air ducts made in a funnel form, and used substantially as described.

Third, Using water pipes or channels, substantially as and for the purpose set forth.

Fourth, Using water pipes and air tubes in combination, substantially as set forth and described.

Fifth, Increasing water pipes and conducting off water from condensed air, substantially as set forth.

48,458.—Washing Machine.—Le Roy S. Starrett, Newburyport, Mass.:

I claim the washing machine herein described, consisting of the seed box, P, false bottom, Q, springs, R, plunger, O l, adjustable rod, M, walking beam, H, crank, F, pitman, I, tubes, J K, pawl, N, and ratchet wheel, L, all arranged to operate as specified.

[This invention relates to a new and improved clothes washing machine, of that class in which all up and down aleenger is employed, and it consists in a novel means for operating the plunger, whereby an up and down, and also a rotary motion is communicated to the same, and the invention also consists in the employment or use of a yielding perforated partition plate in the suds-box, whereby the cleansing or washing operation is greatly facilitated.]

48,459.—Fulminate Gas Lighter.—Henry B. Stockwell, Brooklyn, N. Y. Antedated June 17, 1865.

First, So applying a fulminate and a hammer or its equivalent, in combination with each other and with a gas burner, as to produce the ignition of the gas issuing from the burner by the action of the hammer, or its equivalent on the fulminate, substantially as herein described.

Second, So combining the stop cock which admits the supply of gas to the burner, with the hammer or its equivalent, as to produce the action of the latter by the act of opening the former to turn on the gas, substantially as herein set forth.

Third, The hollow plunger or hammer, D, rod, q, and caur, t, combined with each other and with the stop cock and burner, and operating substantially as herein specified.

Fourth, One or more cavities, l l, in the plug of the stop cock operating in relating to a passage, f, containing the fulminate, and a passage, e, containing the plunger or hammer, D, substantially as and for the purpose herein described.

48,460.—Fulminating Compound.—Henry B. Stockwell, Brooklyn, N. Y. Antedated June 17, 1865.

I claim the fulminate compound, composed of materials herein specified, in about the proportions herein set forth.

48,461.—Street Lamp.—James Stratton, Brooklyn, N.Y.:

I claim the two reflectors, B D, with vitreous, corrugated surfaces, in combination with the street lamp, A C E, all constructed, arranged and operating as and for the purposes specified.

48,462.—Carbine Socket.—John S. P. Taylor, Oxford, Ohio:

I claim a carbine socket formed of alternate layers of cloth and India rubber, or their equivalents, substantially as described and to the effect set forth, as a new article of manufacture.

48,463.—Spring Catch for Window Sash.—William Toshach, New York, N. Y.:

I claim the arrangement in or upon a window sash in combination therewith and with the arms, c and d, of an angular lever, A, of a spring actuated window catch (B), and a hinged lever and window knob (a b), as described, in such a manner as that pressure exerted upon the knob to raise the sash will also disengage the fastenings, all substantially in the manner herein set forth.

48,464.—Device for Preventing Snow Drifts on Railroad Tracks.—L. D. Walrad, Sycamore, Ill.:

I claim the employment or use of inclined planes, placed at the side of and in a relative position with the track, to operate in the manner substantially as and for the purpose set forth.

Second, I also claim the manner, substantially as shown and described, of constructing the inclined planes so that they may be adjustable, as and for the purposes specified.

[The object of this invention is to obtain a means whereby snow will be prevented from drifting and accumulating on railroads, where the latter are by the side of hills, or have an elevation on one side of them.]

48,465.—Machine for Putting Head Filling on Trunk Nails.—Zachariah Walsh, Newark, N. J.:

I claim. First, The employment or use of a rotating wheel, A', provided with recesses to receive a series of dies, j', in which the paste boards, D, and plates, C, are deposited, in connection with a punch, G", and a nail-driving mechanism for pressing or passing the nails through the pasteboards and plates, substantially as and for the purpose herein set forth.

Second, The rotating notched wheel, L", encompassed partially by he strap, S", in connection with the jaws y" y", for the purpose of presenting the nails properly to the punch, G", and the pasteboards and plates in the dies, j', substantially as described.

Third, The parallel bars, p" p", in combination with the hopper, H", wheel, L", and spouts, J" K", for the purpose of presenting the nails to the wheel, L", substantially as set forth.

Fourth, The perforated tubes, N N, to receive the sheet-metal plates, C, arranged in the machine substantially as shown, so as to be movable and placed alternately in positions for being filled and discharged, as herein described.

Fifth, The employment or use of an air pump, W, in connection with a lifter, X, arranged as shown, or in any equivalent way, for the purpose of taking the plates, C, from the tube, N or N', and depositing them in the dies, j', of the wheel, A, as set forth.

Sixth, The spring, n, at the upper end of the tubes, N N', in connection with the pressure lever, L', and the slide, M', or its equivalent, arranged substantially as shown, for the purpose of liberating the upper plate in said tubes, and a dmitting of the discharge of the same at the proper time, substantially as described.

Seventh, The rod, S, fitted in the tube, N or N', and operated upon by the weight, V, in combination with the spring, n, pressure lever, I', and the slide, M', or its equivalent, for the purpose specified.

Eighth, The catch, X', arranged with the rod, V', of the lever, U', substantially as shown, in combination with the pivoted plate, e", provided with the arm or bar, g", connected with the catch, X', by the links, h", for the purpose of constituting a means for the several stop mechanisms herein described, to act upon the lever, U', and clutch, I, as set forth.

Ninth, The rods, E" F", passing through the arm, g', and provided with the collars and springs, as shown, and arranged with the pivoted plate, e", and the arm, g", of slide, Z, to operate or act upon the latter, so as to stop the machine when necessary, as herein described.

Tenth, The rod, E"', passing through the pivoted plate, e", and provided with the collar, h"', in connection with the lever, D"', and rod, C"', connected with the arm, f"', all arranged substantially as shown, to form a stop mechanism for the nail-discharging device, as set forth.

Eleventh, The lever, R", with pendant-pivoted bar, Q", provided with the shoulders, d", in connection with the projection, e"', on the slide, Z, the lever, R, being placed relatively with the plate, e" and all arranged as shown, to serve as a stop mechanism for the wheel, L', as described.

Twelfth, The lever, X", connected with the lever or bar, Z", by the link, Y"', in connection with the spring, C"', and the cam, A"', on the shaft, G, all arranged as shown, for discharging the nails from the wheel, A'.

Thirteenth, The bent or curved bar, Y, spring, e', and the arm, g' of slide, Z, for operating the lever, X, or moving it from over the tube, N or N', to a proper position over the wheel, A', and back again over the tube, N or N', for the purpose specified.

Fourteenth, The plunger rod, r, and spring, o, in connection with the lateral projection, p, an arm, g', for ejecting the plates, C, from the cylinder, q, for the lifter, as set forth.

Fifteenth, The rod, T, attached to the arm or operate or plate, k, of the rod, S, and provided with an upper beveled end t, in combination with the fixed plate, t', and catch, X', all arranged substantially as shown, to form a stop mechanism in connection with the discharging of the plates, C, from the tube, N or N', substantially as described.

[This invention relates to a new and useful machine for putting the pieces of pasteboard on trunk and similar nails, and which form the principle portion of the filling for the enlarged heads of said nails.]

48,466.—Girdle for Roller.—Hervey Waters, Northbridge, Mass.:

I claim a self-adjusting roller guide, constructed to operate substantially as set forth.

48,467.—Mode of Driving Machinery.—Walter S. Wells: New York City, and S. B. Wells, Middleburgh, N. Y.,

We claim the employment, in combination with a motive spring and the system of gearing, a governor and friction-controlling and regulating device, substantially as and for the purposes hereinbefore set forth.

48,468.—Stave Machine.—P. Werum, Berlin, Ohio:

I claim the sliding frame, B, the adjustable saw frames, C C E E, the adjustable rest, G, and arch, L, the catch, J, fingers, g g and curved lever, n, when these several parts are arranged so as to operate as and for the purpose set forth.

48,469.—Churn.—Isaiah M. West, Wilmington, Ohio:

I claim the combination pin, D, in the lever slot, e, and dasher rod, c, with the spring catch, f, for the purposes herein specified.

I also claim the construction of the dasher, C, with the vertical perforated sides, h h, close rim, g, and close sewing lids, G G, substantially as and for the purposes herein set forth.

48,470.—Railroad Switch.—Wm. Wharton, Jr., Philadelphia, Pa.:

I claim the combination of the permanent rails, A A', of the main track the permanent rails, B and B,' of the turn out, and the rails, D and D', comprising the movable switch, and forming continuations of the permanent rails of the said turn out, when the rail, D, is so inclined that it will raise the wheels on one side of a car above the permanent rail, A, of the main track, prior to the wheels being guided laterally by the tapering rail, D', or its equivalent, all substantially as set forth.

48,471.—Printing Fluid.—Edwin Whitefield, Buffalo, N. Y.:

I claim a printing fluid composed and manufactured of the ingredients and applied substantially as herein described.

48,472.—Roller Die.—Geo. W. Wicks, Brooklyn, N. Y.:

I claim the combination of the rolls with an adjustable worm shaft arranged substantially as specified and for the purposes set forth.

48,473.—Guard Finger for Reaping Machines.—Andrew Winterburn, Albany, N. Y.:

I claim constructing the guard finger or knife guar , A, with the

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chambers or cavity, B, and casting hard metal in said cavity or chambers, substantially in the manner and for the purpose described.

48,474.—Machine for Punching Leather.—L. H. Wood, Marlboro, Mass.:

I claim, First, Giving a simultaneous lateral motion to the punch carrier, B, and bed, E, substantially as set forth and for the purpose described.

Second, Holding the work by means of the presser, L, during the lateral translatory movement of the punch, substantially as described.

Third, Rendering the punch adjustable so as to punch holes any required distance apart, substantially as described.

48,475.—Locks.—Linus Yale, Jr., Shelburne Falls' Mass.:

I claim, First, The contrivance substantially as described for holding a bolt in place.

Second, The combination of a lock case containing a bolt with a cylindrical chamber containing tumblers, all constructed and arranged with reference to each other, substantially as described, whereby the lock may be made right or left hand, or fitted to either thick or thin doors, the combination being substantially as set forth.

Third, I claim the combination of a cylinder containing tumblers and having a screw cut thereon, with a lock case having a nut attached to or making part thereof, and a screw pin or its equivalent arranged as described, whereby the former may be attached to the case so as to fit doors of different thicknesses, and secured in position by a dence which is so arranged as to be acted upon through the bolt hole.

Fourth, I claim notched pin tumblers in combination with a key hole slit narrower than the diameter of the pins, and

I also claim notched containing recesses in combination with a key hole slit narrower than their diameter, the combinations being substantially such as described, and operating substantially as set forth.

Fifth, I claim in combination with a cylinder containing a key hole and pin tumbler, a wing or lazy arm, constructed and operating as specified.

48,476.—Reversing the Motion of Screw Tops.—Linus Yale, Jr., Shelburne Falls, Mass.:

I claim the combination of two recessed pullies with two corresponding desks to clutch therewith, and a line spindle to which the latter are attached, arranged substantially as described, so that the spindle can be clutched to either pully and made to rotate in accordance with the motions thereof by a force employed to push or to pull said spindle longitudinally in either direction, substantially as described.

48,477.—Vegetable Washer.—F. W. Bacon (assignor to the New York Dessicating Company), New York City:

I claim the hollow perforated shaft, B, receiving water at one end and delivering it in numerous jets or streams from its perforations, in combination with the revolving cylindrical cage and the spiral grate or grates, or their equivalents, arranged between the said shafts and the circumference of the cage, substantially as herein described.

48,478.—Manufacture of Wrought Iron from the Ore.—Horace Boardman (assignor to himself, and Kelby, De Mill & Co.), New York City:

I claim, First, The reducing fire, F, combined with the gas chamber, G, and its tuyers substantially as described, for the purpose set forth.

Second, The combination and arrangement of said reducing fire with a reverberatory furnace and balling hearth, in the manner described, as that the escaped combustible gasses from the said furnace or hearth, can be used, when ignited by blasts of atmospheric air for deoxidising and smelting the ore in the said reducing fire, as herein set forth.

Third, Subjecting the ore in a reducing fire while mixed or in contact with carboraceous fuel, to the action of the escaping gasses from the fire on the grate, A, the gasses being ignited by the introduction of atmospheric air, substantially as herein described.

48,479.—Machine for Perforating Paper for Telegraphs.—Leverett Bradley. Jersey City, N. J., assignor to Marshall Lefferts, New York City:

I claim, First, The punch, c, actuated by the lever, h, and regulated in its movements by the adjustment of the nuts, Q Q, and shackel, substantially as specified.

Second, I claim a reciprocating punch, in combination with a pair of rollers, for drawing the paper along, and with a ratchet movement actuated by the reciprocation of the punch, substantially as specified.

Third, I claim a spacing lever or levers combined with a pair of rollers for drawing the paper along, and with a device for perforating the paper, substantially as and for the purposes specified.

48,480.—Amalgamating Pan.—Smith W. Bullock, Elizabeth, N. J., assignor to The Bullock Ore-dressing Machine Co.:

First, I claim the arrangement of the shafts of the plate, E, and of the roller, D, in a vertical position, or nearly so, in connection with the pan, B, for the purposes set forth.

Second, I claim the application of the springs to the boxes, I I, for the purposes described.

Third, I claim the application of gear or blank wheels or of band pulleys to the shafts, C F and G, and to the pan, B, for the purposes herein set forth.

Fourth, I claim the application of an elastic coating or jacket to the roller, D, in combination with an amalgamated plate of copper or other metal, for the purposes herein set forth, each of the several features being arranged substantially and for the purposes described

48,481.—Water-proof Soles.—John W. Colburn (assignor to himself and O. F. Case), New Haven, Conn.:

I claim a sole composed of an interior of rubber and a margin of sole leather, cemented together by a vertical butt joint, and of uniform thickness, or nearly so, without an insole, and made substantially as herein described.

48,482.—Snap Hook.—Edward A. Cooper (assignor to himself and J. M. Johnston), Buffalo, N. Y.:

I claim the tapering spring, d, fitting and working in a corresponding groove in the thumb piece, E, and passing through and secured by the mortice, C, and lug, C', substantially as described.

48,483.—Manufacture of Iron.—Alexander H. Everett (assignor to American Car Wheel and Railway Chair Manufacturing Co.), New York City:

I claim, First, The employment of "cryolite," or its component elements, in the melting of cast iron, for the purpose of refining and strengthening the same.

Second, The employment of cryolite or its component elements in the melting of cast iron and wrought iron mixed, thereby producing a metal of great strength and fineness.

Third, The use of cryolite as a purifying agent in the melting of iron.

48,484.—Button Hole.—Henry B. Fairman (assignor to the Metropolitan Collar Company), New York City.

I claim the construction of a button hole with a recess, b'', at or near the middle of the length of one side, substantially as and for the purpose herein specified.

48,485.—Apparatus for Puddling Iron.—John Griffiths, Litchurch, England; (assignor to himself and Z. S. Durfee), Pittsburgh, Pa.:

I claim, First, Attaching the jib, q, which carries the hanger, r, (through the intervention of which motion is communicated from the crank, x, to the rabble or stirring tool, v, in puddling and other operations) to a base or plate, d, which is movable automatically in a horizontal plane substantially as and for the purposes hereinbefore described,

Second, Giving a reciprocating lateral motion in an arc of a circle to the jib, q, and consequently to the hanger, r, through the partial rotation of the movable plate, d, produced by means of the curved endless rack, 8, and the pointed shaft, 5, having on its end a pinion working in said rack, and which carries with it the forked lever, 11, substantially as hereinbefore shown,

Third, Controlling the movement of the hanger and rabble by means of a bow, 2, proportioned in shape and dimensions to the character and extent of the furnace bottom in which the rabble is to work.

Fourth, Providing the free end of the hanger, r, to which the rabble is attached, with a double fork, or the rabble with double pins at suitable distance apart to compensate for the irregular enlargement of the furnace bottom.

Fifth, Placing the axis around which all the movements of the apparatus are made so far back of the line of the working hole as to produce a leverage in the action of the rabble at certain stages of the operations in order to clean the ambs of the furnace.

Sixth, Also communicating the peculiar stirring motion to a stirring tool or rabble in puddling or other operations by loosely attaching the free end of the tool to a hanging rod, to the point of suspension of which a reciprocating motion is given from side to side, while a simultaneous, but more rapid motion is given to the hanging rod or tool holder to and fro, in the direction of the tool, by means of the combination of devices for that purpose, constructed and arranged substantially as hereinbefore described.

48,486.—Stave Machine.—George R. Hay (assignor to himself, and J. R. & E. Seeley), Edgarton, Ohio:

I claim the arrangement of the adjustable brackets; H H', with the adjusting screws, rollers, F F', and saw D, operating as and for the purpose set forth.

I claim the carriage, P, gauge, L, cam lever, p', dogs, r r, and springs, c', when arranged and operating as and for the purpose described.

48,487.—Baling Press.—Horatio F. Hicks (assignor to Hicks Brothers), Grand View, Ind.:

I claim, First, The revolving cage or cam operating to automatically open and close the feed door, and to elevate and depress the packer by a force independent of its gravity substantially as set forth,

Second, The arrangement of nut, D, sill, E, transom, C, collars, F, rings, H H', and rollers, G, for the support and easy operation of the press as set forth.

Third, The provision of the parts 11, 22, 33, 44, 55, 66, or their equivalents for the purpose explained.

48,488.—Numbering and Paging Machine.—George J. Hill, Buffalo, N. Y., assignor to himself and H. G. Leisenring, Philadelphia, Pa.:

I claim, First, The reciprocating crosshead, H, and its system of numbering wheels in combination with the endless apron, I, the whole being arranged for joint action, as set forth for the purpose specified.

Second, The bars, V, and V', adapted to inclined openings in the standards or guide pieces, T, and T', and suported by a spring or springs all substantially set forth as and for the purposes specified.

Third, The hanger 8, with its numbering wheels, and the spring 10, or their equivalents for rendering the said numbering wheels self-accommodating to the thickness of the book, the pages of which have to be numbered.

48,489.—L. D. Hoit, Medford, Mass., and Robert Murry, Boston, Mass., assignors to James W. Tufts, Medford, Mass.:

First, The deflector, G, constructed and arranged substantially as set forth, in combination with the chamber, E, or its equivalent, for the purposes described.

Second, The combination of the cone, F, with the cone, G, and nozzle, E, substantially as and for the purpose described.

Third, Providing the cock, C, with two channels, a and b, and so arranging the same that the one may be opened and shut by means of the valve, L, and the other by giving a partial rotation to the cock itself, substantially as and for the purpose described.

48,490.—Machine for Making Paper Boxes.—T. C. Luther (assignor to himself and American Flask and Cap Company), Waterbury, Conn.:

I claim the cutters, H, in combination with the rollers, B C, arranged to operate in the manner substantially as and for the purpose specified.

48,491.—Damper.—Nathan R. Ramsey (assignor to Daniel Pomroy), Orange, Mass:

I claim the above described improved heat regulator or damper, or combination and arrangement of the ring, a, and the two series of concave convex bars, b b b d d d, with openings between them, as set forth.

48,492.—Desiccating Kiln.—W. J. Rand, Brooklyn, N. Y. assignor to the New York Desiccating Company, New York:

First, I claim a kiln for desiccating purposes, constructed with two or more desiccating chambers, C C', one above another, having double or hollow floors, a c, heated by steam pipes, d, with an air heating or distributing chamber below, from which heated air enters the desiccating chambers by flues, h h, at the sides or corners thereof, and with a central ventilating shaft communicating with the several chambers, for the escape of the moisture, the whole combined or ranged, and operating substantially as herein specified.

Second, In combination with a kiln having several desiccating floors or chambers arranged one above another, I claim one feeding trunk, F, common to all the chambers, communicating with them by apertures fitted with doors, m m, hinged at the bottom, and so constructed that when thrown back from the said apertures, they close the feeding trunk below, and from inclined planes down which the substances slide into the desiccating chambers, substantially as herein specified.

48,493.—Printing Press.—James Sangster (assignor to himself, Rockwell, Baker & Hill, and E. B. Sangster), Buffalo, N. Y.:

First, I claim a revolving cylinder having a number of plain surfaces upon its periphery or cirumference, for the purpose of recessing the paper or card board to be printed, and resisting the pressure of the type when brought down against it when said cylinder is so constructed as to move and present its plain surfaces one at a time at the proper angle to receive an impression.

Second, I claim the springs, U' and U2, between which the inking roller, S, is suspended for the purposes specified.

Third, I claim, in combination with the revolving cylinder or roller, B, three or more slats such as are shown at, F8 F8 and F8, for the purpose of holding the card board or paper in place while being carried under the belts, B3 and B4, and in the position to be printed when formed necessary to feed or lay the cards or tickets in by hand.

Fourth, I also claim, in combination with numbering wheels, a revolving roller in cylinder, upon the periphery or circumference of which the tickets or cards are numbered.

48,494.—Railroad Spike.—William Mount Storm, Harlem, N. Y.; assignor to himself and Chas. J. Ferguson, New York City:

As an improved article of manufacture, I claim a railroad spike made substantially as herein described.

[This invention relates to improvements in railroad spikes, the object of which is to produce a spike that, when driven into the sleeper and brought to its "seat," it shall be so fastend therein that the movement of the cars over the rails will not in the least degree loosen it, the advantages of which are manifest to all.

48,495.—Grain Elevator.—Francis Taggart, Lewis S. Chichester, and Clark W. Mills (assignors to George H. Nichols), Brooklyn, N. Y. Antedated June 12, 1865.

First, We claim a floating elevator for grain, formed with a deck extending across a space left for the reception of a canal board or large between two floats, and provided with an elevator or elevators working through such deck for the removal of grain from the said canal boat or large, substantially as specified.

Second, We claim the spout, k, sliding in the trunk, l, in combination with the elevator, d, fitted to be raised or lowered, as and for the purposes specified.

48,496.—Rolling Apparatus.—Edward Wassell (assignor to himself and Archibald McFarland), Pittsburgh Pa.:

I claim, First, The use, in a series of three high rolls, of one grooved roll and two flanged or tongued rolls, the grooved roll being placed between the other two rolls, substantially as and for the purpose hereinbefore described.

Second, The use of L, shaped guides in combination with the grooved roll in the middle of a series of three high rolls, for the purpose of giving the iron a bearing from the points to the heel of the guide as it passes from between the rolls as well as clearing it from the groove, substantially as hereinbefore described.

48,497.—Metallic Hoop for Barrels, Casks, &c.—Wm. Wilson, Jr. (assignor to himself and Charles Green), Wilmington, Del.:

I claim a corrugated or crimped metallic hoop for casks, barrels, kegs, &c., substantially as herein shown and described.

48,498.—Bench Hooks and Clamps.—E. P. Wood, Lowell, Mass., and A. E. Blood, Lynn, Mass. assignors to Wood, Sherwood & Co., Lowell, Mass.:

We claim the jaws A B, in combination with the hook, E, and connecting bar, C, substantially as and for the purposes set forth and described.

We claim in combination with the jaws, A B, and hook, E, making the apparatus adjustable for thick or thin material by means of the rack, D, and pin, C, or equivalents therefor, substantially as and for the purposes set for forth and described.

48,499.—Extracting Gold and other Precious Metals from their Ores, etc.—Henry Wurtz (assignor to Wurtz Amalgamating Company), New York City:

I claim, First, The combination with quicksilver, when used for the extraction by amalgamation of metals from their ores or their mixtures with other materials of metallic sodium or metallic pottassium or any other highly electro-positive metal equivalent in its action thereto, as above set forth.

Second, In those amalgamations in which amalgamated plates of copper or other metal ore used, the substitutions for the plates of copper or other metal, of coated with quicksilver combined with sodium or other highly electro-positive metal, as above set forth

Third, The coating of iron, steel, or other metallic surfaces between or under which ores or other materials are crushed with quicksilver combined with sodium or other highly electro-postive metal, as above set forth.

Fourth, The prevention of the granulation or flowing of quicksilver when used in any method of amalgamating ores or other materials by addition thereto of sodium or other highly electro-positive metal, as above set forth.

48,500.—Enamel.—Theodore L. Oest, Berlin, Prussia (assignor to Henry Maurer and Adam Weber, New York City.):

I claim an enamel powder composed of the different parts mentioned and in proportions substantially as specified and set forth.

48,501:—Heating Stoves.—John Crea, Allegheny City; Pa.:

I claim, First, The use of an air-chamber placed at the top of a close stove and having an imperforate top or cover and a perforated bottom when such bottom is so curved substantially as hereinbefore described, so as to form a circular recess for the detention of the gas and smoke.

Second, Also so arranging the perforated air-chamber constructed substantially as hereinbefore described, that its top and sides, or the top alone, shall be parallel, or nearly so, with the top or cover of the stove, and at such a distance therefrom as to leave a narrow passage for the flame.

REISSUES.

2,010.—Step Ladder.—John H. Balsley, Dayton, Ohio Patented Jan. 7, 1862:

I claim, First, The supports, A A, made of strips, whose ends are connected together, forming between them are elongated ellipsis, as and for the purpose specified.

Second, The braces, D D, in connection with the supports, A A, and steps, b b, to give strength laterally, as is specified.

Third, The jointed cross piece, G, and slotted rods, g g, for adjusting the supports, F F, laterally, as herein specified.

2,011.—Wheat Drill.—Jacob B. Crowell, Greencastle, Pa. Patented June 23, 1863:

I claim, First, A horizontal rock shaft, provided with stirrers, G, and wipers, D, substantially as set forth.

Second, I claim a horizontal rock shaft, when armed with spikes or stirrers, G', on the upper side of the shaft, substantially as specified.

Third, I claim the horizontal rock shaft, in combination with the curved metallic bottom of the hopper, substantially as described.

Fourth, I claim so arranging and operating a rock shaft that the spikes or stirrers on the upper side of the shaft will prevent the arching of the guano and bring the same down to a point reached by the stirrers on the under side of the rock shaft, and thus agitate and feed down the entire mass of the guano in the hopper, substantially as specified.

2,012.—Combined Measure and Funnel.—Samuel R. Dummer, New York City. Patented April 5, 1864:

I claim as a new article of manufacture a combined vessel and funnel, substantially as and for the purposes specified.

2,013.—Tea and Coffee Pot.—E. B. Manning, Cromwell, Conn.—Patented June 3, 1862:

I claim the herein-described tea or coffee pot, in which the bottom and lower portion of the body is constructed of hard metal, as iron, united to a Brittania body in the manner described, when the said hard metal body and bottom are formed in the manner described, and united to the Brittania bottom a sufficient distance from the bottom to protect the Brittania from the effects of heat or other injury, as and for the purpose specified.

2,014.—Reaping Machine.—C. W. and W. W. Marsh, Clinton, Ill. Patented Aug. 17, 1858. Reissued July 5, 1864:

First, We claim the secondary, elevating band of rakes, F, consisting of toothed slats extending across on the under side of a slotted platform, the teeth protruding through the slots, in the manner described, and used in connection with the binder's grain receptacle, I, substantially as and for the purpose set forth

Second, We claim the loose cover, H, whose upper and lower edges are curved, as described, when used in connection with the steady pins, h h h h, and the secondary band of rakes, as described

2,015.—Reaping Machine.—C. W. and W. W. Marsh, Clinton, Ill. Patented August 17, 1858. Reissued July 5, 1864:

First, We claim the binder's tables, M M, when used in connection with the concave, I, or other equivalent grain receptacle, substantially as and for the purpose set forth.

Second, We claim binder's platform, J, when used in connection with tables, M M, substantially as and for the purpose specified.

Third, We claim the relative arrangement of the several parts of the binding attachment, as shown in figures 2 and 3; a table, M, at each end of the receptacle, I, and platform, J, the binder's stand between said tables, substantially as and for the purpose set forth

2,016.—Chair Bottom or Back.—Isaac P. Tice, New York City, assignee by mesne assignment of Austin T. Smith. Patented May 25, 1858:

I claim the employment of perforated sheet metal in the bottoms or seats and backs of chairs, and other articles of furniture for sitting and recumbent purposes, substantially as herein described.

2,017.—Harvester of Grain and Grass.—Andrew Whitley, Springfield, Ohio, assignee by mesne assignment of John J. Weeks. Patented September 26, 1854.

I claim, First, Making that portion of the upper part of the guard fingers of a harvester which rests on the finger bar in two parts, one on either side of the lower part, but neither of them over it, or any screw or bolt passing through it and the finger bar, through which it is passed.

Second. The combination of the herein described short cutter and narrow divider and a track clearer with a harvester finger bar, which is connected to the axle of the cutter's driving wheel in such a manner as to rise and fall with the undulations of the ground over which it is drawn, irrespective of the risings and fallings of said axle.

Third The combination of a revolving track clearer with the outer end of a harvester's finger bar in such a manner as to have no part of the machine between the ground and that part of this track cleaner which separates the cut from the uncut grass, neither any part of it between the finger bar, the revolving track clearer, and that part by which it is connected to the finger bar.

Fourth. The combination or a revolving track clearer with the outer end of a harvester's finger bar and a wheel connected therewith in such a manner that the attendant of the machine can, while the machine is in operation, make this wheel carry said end or not as he desires, substantially as shown and desired.

DESIGNS.

2,103.—Coffin Stud.—Daniel A. Clark, Pawtucket, R. I.

2,104.—Coffin Handle.—James S. Ray, East Haddam Conn.

2,105.—Plates of a Stove.—Garrettson Smith and Henry Brown, Philadelphia, Pa., assignors to Raymond Campbell & Co., Middletown, Pa.

2,106.—Panel of a Stove.—Garrettson Smith and Henry Brown, Philadelphia, Pa., assignors to Smith, Wells & Co., Roger's Ford, Pa.

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PATENTS

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CHAS. MASON.

[See Judge Holt's letter on another page.]

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

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Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5 accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention; the Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is no little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
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Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignment of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

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Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They thing they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Pamphlets of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO. Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

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Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model, is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express prepaid) should be addressed to MUNN & CO. No. 37 Park Row. New York

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

STEAM GENERATORS AND ENGINES.—THE AMERICAN Safety Steam Engine Company are manufacturing Brayton's Patent Steam Generators and Engines. There is a saving of 25 per cent in fuel over ordinary engines and boilers and they cost but little to keep them in repair. There is no possibility of exploding the generator. For particulars and circular address GEO. WOODMAN, Treasurer and Agent, 84 Washington st. Boston 2 12

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TO MANUFACTURERS AND MERCHANTS!

STUTTGART, CARLSRUHE AND NUREMBERG.

INVITATION.

The Industrial Museum of the Royal Wurtemberg Board of Trade and Commerce at Stuttgart; the Industrial Museum of the Grand Duchy of Baden, at Carlsruhe, and the Industrial Museum of the Town of Nuremberg have made an agreement, according to which they will receive from manufacturers and merchants of all countries objects such as mentioned below, for the purpose of exhibiting the same in turn at each of the three towns named, under conditions, offering great advantages to the contributors.

1. Raw productions, for which new applications have been found in the art and industry
2. Newly invented or improved tools and machines.
3. Newly invented or improved manufactures, which are not generally known.

Those who are desirous of sending objects for exhibition have to apply to the Boards of one of the institutions mentioned, aming the objects to be sent in, and stating at the same time their size, weight and peculiarities, as well as their selling prices, either at the place of manufacture or at the place of exhibition, with indications as to the names of the firms of which the like objects may be ordered, and of the agents charged with the sale of the article to be exhibited.

The reception of goods at each of the three towns named above will begin on the 1st of May, 1865, and the time allowed for each object to remain in the exhibition will be generally four weeks at each town.

On the objects thus to be exhibited labels will be affixed, stating, in case that patents have been obtained on any of them in which countries that have been granted, and statements to the same effect will be made in the weekly papers, published by the Boards of the said institutions

Manufacturers and merchants desiring to avail themselves of this opportunity of bringing their products in the shortest time to the knowledge of the people of Southern Germany, and of securing by this means a more extensive sale for them are now invited to address themselves to one of the undersigned Boards, who will be happy to communicate to them copies of the printed sheiches, containing all the particulars.

The Board of the Royal Wurtemberg Industrial Museum, at Stuttgart. Dr. STEINREIS.

The Board of the Industrial Museum of the Grand Duchy of Baden, at Carlsruhe. DELTZ.

The Board of the Nuremberg Industrial Museum, at Nuremberg. DR. BEEG.

March, 1865. 2 2m3t

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His works are eligibly located between New York and Philadelphia, on rail and canal.

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DETROIT, June 29, 1864.

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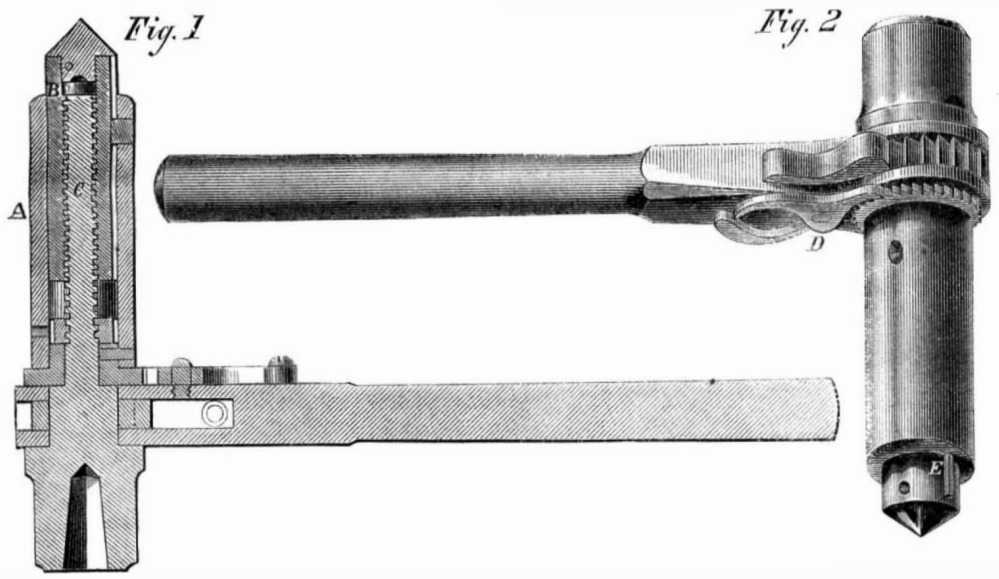
Improved Self-feeding Ratchet Wrench.

The great demand for ratchet drills of late has caused much activity in this branch of business, and efforts have been made to render these tools as complete as possible. Every machinist or other mechanic who has occasion to use these tools knows that it is very troublesome to feed up continually, and that an efficient device to do this is very desirable. We publish herewith an engraving of an improved ratchet wrench for this purpose, which is thus described by the inventor:—



CHAPMAN'S SELF-FEEDING RATCHET WRENCH.

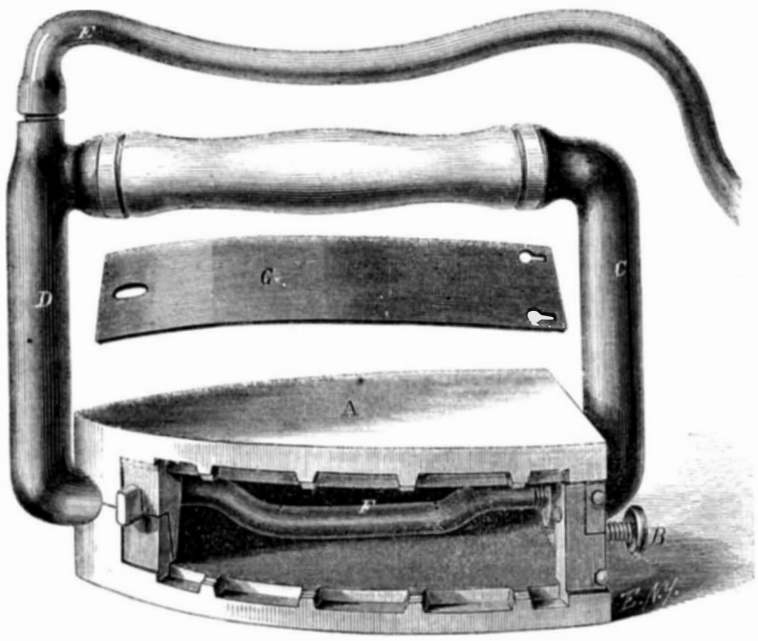
"The advantages claimed for this drill are quite obvious. By its self-feeding arrangement a great saving in time is secured, at least one-third. By the perfect regularity in feed thus secured, the drills are not liable to break, which is frequently a source of trouble with ratchet wrenches. It is manufactured of the very best materials and in the most workmanlike manner. In using this wrench one-third of the stroke gives the required feed, or by taking short strokes the sleeve can be revolved completely round without turning the drill, as the ratchet has a greater number of teeth in the feed gear than in the ratchet gear. The hole in the sleeve, A, is for running the nut, B, down on the feed gear after it has been fed out; the nut moves out and in by means of a screw, C, fitted with a spline and feather, E, attached to the nut and sleeve (Fig. 2). Should the ratchet feed too fast the feed pawl, D, can be thrown out, or any required feed can be obtained by rotating the handle. Place the thumb of the left hand upon the pawl, press down the spring so that the pawl will not come in contact with the ratchet gear. By this method the handle will turn without turning the drill socket, while the feed pawl and gear will turn the sleeve from one tooth to any number of teeth."

This is a convenient and strongly made wrench and was patented by J. C, Chapman, May 3, 1864. Address J. J. Walworth & Co. for further information 18 to 24 Devonshire street, Boston, Mass.

Double-faced Sad Iron.

In China, clothes are ironed by men in a novel manner. Filling the mouth with water they squirt it through the teeth over the garments and then push a pan, filled with hot coals, over the moistened surface. This is rather primitive, and is open to some objections. In the accompanying engraving we publish an illustration of a new sad iron, which is a labor and fuel-saving device, inasmuch as it obviates the necessity of a stove for heating the irons, dispenses with walking back and forth to the same, and last, but not least, preserves the face of the iron intact or uninjured. This is important to those who are fond of glossy linen—for the polish, remarkable in new shirts, etc., is put on by a burnished iron and hard pressure, not by chemical preparations or mixtures, as most people suppose. With common starch, "elbow grease," and a polished iron, linen can be superbly finished.

In detail this affair consists of an iron, A, having two polished surfaces, top and bottom; both of these are used in turn, and the top is heated while the bottom is in use. When the bottom surface is too cold



TARBOX'S DOUBLE-FACED SAD IRON.

the iron is reversed by slacking off the screw, B, in the end. The iron then turns completely over in the handle, C. The iron is heated from a gas pipe, D, to which it is connected by the flexible pipe, E. Inside the iron is the burner, F, which is merely a pipe with small holes in it. The plate, G, covers this aperture and also admits air to keep up combustion. This is an ingenious device and one well adapted for the purpose. An "ironing" can be done much quicker with it while the saving in labor and fuel would also be considerable.

It was patented on May 19, 1863, by J. L. Tarbox. For further information address the patentee at Wyoming, Pa.

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